The Builder.

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The Church of St. Mark, Venice.

QUITE alone in architecture stands the Church of St. Mark in Venice; it belongs to no style, it is a style in itself; it is without antecedents, it has remained without imitations,—perhaps, we may say, it is incapable of being imitated, for the scale is part of the style, and the richness of the decoration no less so; in its completeness it is an architectural resultant of the long history of Venice, and the history of Venice is too peculiar to have had parallels, or to be likely to be repeated.

It is usual to ascribe much of the peculiarity of the building in plan, construction, and decoration to Byzantine influence, and to consider that in this way its riddle is explained,—its evolution accounted for,—but little, indeed, is to be made out in this way on accurate comparison; we may recognize Byzantine details, features, processes, ornaments, but at last the renunciations, and the protests against any Eastern prototypes we know, are more important than the adoptions and adaptations.

We shall do better justice to the subject by leaving aside at the present time the attempt to affiliate the structure by inconclusive or insignificant family resemblances,—a view of the subject sure to be well taken care of elsewhere,—and by taking well to heart the manifest fact that whencesoever the designer of St. Mark's may have collected hints, as whencesoever he may have gathered his materials or his workmen, it was due to his own energy of organization, to the vivacity of his own fusing and remodelling imagination, that their ultimate form and arrangement, their harmonized unity and truly original effect, are to be ascribed. This is one of the cases where the enjoyment of art supersedes, or, at least, subordinates the interest of archæology. *Materiem superavit opus;* the idea of the architect dominates the materials he works with and works upon, even when sometimes he seems to adapt them in their very crudest form. The name of the architect of St. Mark's is unknown,—his very age is uncertain within a century; but whatever may have been the date at which he commenced his work, or put on sufficient record the leading lines of his conception, his spirit seems to have been continued to many of those who went on with his work, whether they may have been merely putting into execution his own intentions, or were moved to apply enhancements that almost invariably harmonized in effect.

The church, if we would describe its leading characteristics most summarily, is in plan—apart from some interior modifications—a Greek cross, with aisles on either side of both nave and transept, the nave and its aisles terminating eastward, in semicircular apses, with niches at their ends and sides. Over each arm of the cross, and over the intersection, is a hemispherical dome; five, therefore, in all. The western arm of the cross is enveloped by a portico northward and westward, which is returned on the south side as a series of external chapels, including a baptistery. The interior of the church has its walls encrusted up to a certain height with slabs of veined marble, and where they cease, the decoration is taken up by a covering of mosaics of Scripture subjects with inscriptions, in colours on a ground of gold mosaic. These cover the whole surfaces of the vaults, the domes, the archivolts; below, the pavement is composed of elaborate patterns, in tesselations of most variously coloured stones, and the columns that are introduced are massive monoliths, often of the rarest and most costly marble.

At present a great deal of the pavement is in a state of ruin, and even some large surfaces of the mosaics of the vaults are stripped for reparation. The marble walls are discoloured, whether by mere dirt, or whether their brownish hue may be the more inveterate result of time and exposure. Tarnished are the silver lamps, and dulled the glitter of the heavy compound crosses that hang suspended from the roof, but still the effect of the interior is gorgeous in the extreme, with a gorgeousness that is majestic even at a disadvantage, and in its earliest freshness could have been by no means tawdry. All the minor fittings are of like magnificence. The smaller shafts that support the two pulpits are most beautiful, and so varied as to exhaust the vocabulary of the lapidary; rich slabs form the sides; the screen and all the furniture of the choir, and apse, and altar, has the same character, whatever their ages, of elaborateness, costliness, splendour. We should wish to convey the liveliest conception of this accumulation of costly elements of splendour, that a due impression should be prepared for of the value of the true artistic management by which they are brought under control, and made to subserve a gradual culmination of a larger effect.

The same principles of decoration and the same lavishness are continued in the portico with some new variations, and thence again to the exterior. Walls, vaults, and niches are again encrusted with marbles and historical mosaics, and the pavement with tesselations; the porches also and the intervals on the western wall are now still further clothed by double superposed orders of small columns of various marble, and with capitals as varied; this style of enrichment is still further extended on the western exterior and its recessed porches. These clothing colonnades reach up to the springing of the archivolts, and then are succeeded by covering slabs of marble, with sculptured or more brightly-coloured slabs inlaid, the enclosed semicircles above the portals being occupied by brilliant mosaics, and repeated by others with the same costly embellishments above.

On the gallery above the central porch stand the four bronze horses, so called, of Lysippus—but Greek in any case—transferred originally from Chios to Constantinople; and behind them rises again the range of five archivolts, with intermediate pinnacles, and crested by a richly wild elaboration of foliated crocketing, rising to its highest apex to enclose the emblazoned lion of St. Mark's.

The foundations of the present church of St. Mark's at Venice date from A.D. 977; but they occupy the site, and very probably follow the lines of the earlier ducal chapel destroyed by fire, which is dated A.D. 826,—a century and a half earlier. Thirteen years previously the Venetians had acquired—an ancient inscription in a side chapel says frankly that they stole (*Marcum furantur Kanairii vociferantur*)—the relics of St. Mark from Alexandria. The interest of Venice in Cyprus quite explains her peculiar attachment to the evangelist whose history connects him with the island, and the readiness with which the patronage of the city was transferred to him from San Teodoro.

The main building was completed in 1071, and repaired, after injury by fire, again in 1106. The incrustration, with marble within and without, came later. The bronze horses which now stand above the portico, were brought from Constantinople in 1205, but probably found their present place later, for it was not until quite the end of the fourteenth century—that is, after 1380—that some of the window openings received traceries, and the upper archivolts and pinnacles were added and decorated. The high domes are also work of the late Middle Ages; while the foliated crockets, with intermingled and cresting statuettes that enhance so remarkably the grace and glory of the façade, are as manifestly works of the Renaissance as any of the dated mosaics of the seventeenth century.

The unity of effect which nevertheless results is certainly very remarkable; it is so far successful that the combination of styles is very constantly overlooked here as completely as in the Doge's palace, and thus are bewrayed some who, lavish of praises without qualification for mediævalism in its purity, have no words hard enough for that revival which, whatever it revived, was very largely a revulsion from abuses of a style that was effete. Whatever is most peculiar in the building is at the same time most beautiful and most predominant, and whatever is less original seems by very force of its association to have put on so much of special character as to harmonize by producing agreeable relief rather than to shock by an incongruity.

The five external cupolas have a bizarre effect that adds no little to that peculiar richness of fanciful variation that is often styled Orientalism; but their value tells rather in remoter views than as contributing to the composition as it presents itself from Piazza and Piazzetta. The plainness of their surfaces would conflict with the general enrichment of other parts if they were more obtrusive; to the extent to which they appear their numbers and fantastic outline at least give evidence of the extent of the building behind and intimate sympathy with the multiplied variety of the façade.

This façade is not perpendicular to the main axis of the piazza, nor is this large square indeed even nearly a regular oblong, while still the sides are not so far divergent as to attract ordinary attention. The variety thus given to the presentation of the structure is an immense advantage, whether the result of design or not; the sacred temple seems to assert independence, and, at the same time, escapes an air of contemptuous disregard; it is neither the slave of its position nor forgetful of its responsibilities.

The exterior of the building carries more marks of alterations than the interior; perhaps instead of alterations, we should say of successive additions and completion at intervals; and yet the comparatively few changes and additions that have been made within derogate much more from the general value of its effect. To this point, however, I shall return.

The effect of the façade has been made the subject of glowing and picturesque descriptions which it would be vain to emulate and a little ungracious and unwelcome to criticise; indeed, they involve so much of truth that we may accept the exuberance of ornament like the extravagances of some of Turner's Venetian scenes, as in this sense faithful—they express the effects of the original on enthusiastic imaginations, and may surely therefore be credited to the excellences of the original.

The fundamental plan of the church of St. Mark may assuredly be described as the Greek cross, and it would seem to have been by a slip of the pen that Mr. Fergusson substitutes so distinctly the Latin cross. The full outer breadth across the transepts, including the walls, is as nearly as possible equal to the length from the first step by which we enter the church flush with its front wall, to the outside of the eastern

wall beyond the apse. The numerous recurrences of the Greek cross among the mosaics and upon the sculptured capitals of most archaic style of any in the church vindicate the claim of the form to primary consideration by the designers, who, whatever the freedom with which they treated it, returned to it in distribution of horizontal spaces, as we shall see, over and over again.

The front wall is of double thickness, to admit the introduction of staircases to the upper plan, the entrances to which are on either side of a covered porch, open towards the narthex or covered portico.

We take as the basis of observations the plan of St. Mark's given in the Atlas of Cicognara. It verifies so many logical adjustments that the author was in no way cognisant of, that its general accuracy seems to us to be sufficiently approved. It agrees also very exactly with the later outline by Kreutz.

The thickness of the internal incrustations is given, on what authority for exactness we know not, by a lighter shade or hatching. Whether this enrichment was contemplated from the first or not, the distribution of the interior neglects it and follows proportionate dimensions taken up to the unclothed wall.

The church proper, as we have shown, may be enclosed in a square.

The centre of the central dome on horizontal plan is midway between the back of the extreme niche of the apse and the internal line of wall by the entrance; a transverse line, therefore, through this point gives us the axial line of the transepts.

A central circle equal in diameter to one-fifth of full breadth of inclosing square, includes the horizontally-projected plan of the dome.

The nave dome is of the same diameter as the central dome, and its centre is fixed midway between the interior line of west doorway and the margin of central circle; the interval between dome and dome is thus equal to that between western dome and entrance wall.

The projection of the western dome is flanked on either side by a triplet of columns; the distance from axial line of these columns to centre of nave equals the distance given in the other direction to the flank wall; thus is decided the width of the aisles and the complete internal width of the body of the church.

These lines are ruled through across the transepts with the result of giving a broader interval on either side of plan of central dome than divides it from the nave dome.

The limit north and south of the domes over the arms of the transepts, is now obtained by the dimension from centre of plan to western margin of nave dome; in other words, a circle struck from centre of building will just touch on their remote margins and thus include, the horizontal projections of the nave and of the transept domes.

The breadth of the transept has already become deducible, and consequently the plan upon which its aisles and dome are to be distributed.

A transverse line tangential to eastern margin of nave dome projection, cuts the line of the wall of nave aisle; a column is placed in the aisle upon the line in front of this intersection, and the interior line of transept wall is made to range with the eastern margin of this column on plan.

The semi-breadth of the transept is thus diminished, and becomes less than the semi-breadth of central dome taken with interval between it and nave dome.

The semi-breadth of the transept thus obtained, is now to be halved, and this will give the axial line of an intermediate colonnade, here of two columns only, and by deduction of the semi-diameters of the columns, the diameter of the transept dome.

This diameter appears to have been brought by design exactly to 28 Venetian feet against 36 of the central dome, showing a loss of 4 ft. on each side by the contraction ensuing on the inserted colonnade.

The result—anticipated and aimed at—is most important in subordinating the transepts to the central nave; this is still further pursued by the reduction of the full spread of the transept on plan, by the occupation for closed chambers of so much of the space of full breadth of building as extends beyond the external margins of the transept domes to the north and south. These chambers, however, are not permitted to curtail the breadth of the church absolutely, for they have only the height of a ground story, and support a continuation of a gallery open to the church; and on one side the light of the southern sun is admitted through a large rose window—of later design—above them. This peculiar feature is still more remarkably treated at the western extremity of the church, where the gallery in question is not only extended over the double wall of the entrance, and the inclosed staircases, but this open upper story is extended even over the west porch or atrium, and light is thus admitted into the body of the church through the great window immediately above the advanced west portico. It is this arrangement which gives a certain appearance of increased length to the church, and vitiates so far the primary proportion of the Greek cross.

The lines of the transept ruled through on the eastern side touch the margin of the projected plan of the choir dome. The diameter of this is apparently about 30 Venetian feet, as against the 36 of the centre—the span being contracted as in the transepts, by bearings for an archivolt within the lines of the piers of the centre; the eastern semi-circular cove is struck immediately beyond the projection of eastern dome upon a diameter again reduced on the same principle.

When we glance over the general appearance of the plan as thus brought out, we see that it starts from a single principle of arrangement, then develops by repeated applications of the same principle to successive extensions, and lastly, sets a limit to this process of development, and gives coherence and unity to all comprised within those limits, by subordinating all members to one chief culminant position of interest, by modifying each subordinated member in accordance with speciality of function, and by marshalling all in appropriate sequence and order.

Nothing can well be more alien from the system on which this—systematically enough—is effected, than that rule of planning, on equal squares — *pari-quadrato* — that has sometimes been vaunted as a royal road, at least it were an easy one, to the mastery of noble effects. Assuredly it is no easy problem for the balance to be held between irregular fancy and mechanical coldness in design. Regularity is the [illegible]y soul of that rigid law of discipline that a[illegible]tecture can never relinquish with impuni[illegible]y which alone it can retain mastery over [illegible] manifold and immense assemblages of m[illegible]bers and materials it contends with. But s[illegible]ictest discipline must needs be administer[illegible]d with that discretion of which the equivalent in design is quick apprehensiveness of safely admissible—of absolutely indispensable, adaptation; with that lightness of hand, that treatment with feeling, that can venture from time to time—nay, even constantly as the work proceeds,—to desert the dry perceptive lines of the broad and hard general rule; that can revert to qualifications which, although only admitted at first instinctively, deserve welcome as inspirations; these will constantly be found, on further study, to be themselves amenable to laws as eternal as the one rule that they appear at first to contravene, whereas they in effect co-operate with it.

The general plan of the church, then, as we have seen, is the Greek cross, with arms of equal spread from the centre; but the east and west arms are allowed a more liberal width than the transepts north and south, and thus the dignity of a nave is asserted in this direction. Moreover, while the lengths of the transepts are curtailed on the floor level by assignment of their extreme portions to closed chambers, the eastern arm receives a distinction that shows it as noble above all its fellows,—by an exceptional apsidal termination.

The cross of the general plan has a very marked expression in the void space of nave and transept, which remains after the reduction of the plan by the cross lines that partition off the lateral and transverse aisles. The hemispherical dome over the grand crossing rests on the keystones or rims of the extrados of four great arches that are continued as barrel vaults in the four directions as far, generally speaking, as the edges of the great quadrangle which marks the breadths of body of the church and of the transepts. The transition from the square central plan to the covering circular dome, is effected by coved spandrels or pendentives. This central dome has thus the effect of being the centre of a Greek cross of its own, of which the short and almost equal arms are the pairs of oblongs, north and south, and east and west, that are roofed by the barrel vaults.

The north and south arms of this cross are now applied severally as arms of, again, a northern and southern Greek cross dependent on a domed centre in either transept.

The transept domes, like that of the centre, rest on the rims of four barrel vaults, of which three extend as far in each case as the outer wall of the church, and the fourth as far as the grand crossing. The eastern arms of the crosses thus formed on either side, are appropriated as chapels with altars, out of regard to which, as it appears, the opposite arms of the cross are left clear; the north and south arms, as we have seen, are closed below, but are open above to a late Gothic wheel-window on the south, and on the north to the extreme wall, which is clothed with a rich mosaic. Galleries extend over the closed portions, of which that on the south is divided by a passage giving an entrance to the church from the piazzetta.

The western arm of the central cross becomes in like manner the eastern arm of another majestic cross of which the nave dome covers the centre,—the north and south arms extending to outside walls of the church proper, and the western as far in the first instance as the wall pierced by the entrance door.

Above, this western limb, which is not like the corresponding member in the transepts curtailed below, receives the farther extension already noticed, and includes under its prolongation of vaulting a gallery over the portico or vestibulum, as far as the line of the large west window and the wall behind the projecting outer porches, and their external gallery.

The piers which present an angle at each corner of the square of the central dome, and bear at right angles the barrel vaults across the transepts, and across nave and presbytery, are pierced by arches north and south, and east and west, to give passage to the direct and the transverse aisles, and become thus on plan divided, in fact, into four piers; here again the projected plan gives a small secondary Greek cross, with arms included in each case between the three massive quadrangular piers, and the pier attached to angle of nave and transept wall; the perforation is in two stories,—a loftier opening is below a smaller of more window-like proportions above. The analogy to the large central arrangement is supported by each of these small squares, having again its domical ceiling or cupoletta resting on extra dos and coved spandrels.

The barrel vault of the western arm of the nave cross descends on parallel walls that are pierced with arches again like those that bear the eastern; only the north and south walls of the church, instead of being perforated, are merely clothed with shallow arches; but the square voids in the angles still assert their analogy, and receive each its proper domical vault.

The eastern arm of the central cross becomes the western of another domed at the crossing and above the high altar, in like manner, but in place of a rectangular eastern arm, it receives in this direction a semi-circular apse of full span; the semi-domical head of this is well visible throughout the full length of the church, and is occupied by a colossal mosaic of the seated Saviour on a blazing ground of gold. Below are three smaller niches with semi-domical heads,—that to the left is fitted at the back with the bronze doors of Sansovino that give entrance to the sacristy. It is at this point that the differentiation of the primary type of arrangement is most declared. These eastern domes rest, as in other cases, on grand arches of its full span, but below, to the right and left, the eastern halves are walled up, affording towards the choir backs and seats for stalls, and serving to enclose small chapels at the ends of the north and south aisles; these have apsidal ends eastward and three smaller niches in the thickness of the wall below, reductions, therefore, of the main termination of the church. Above the dividing wall runs the gallery that accommodates organs and orchestra.

The main effect of a grand crucial plan might easily have been disturbed by the importance of the large secondary cross vaults; that it is sufficiently salient on first entrance into the church, is due to the skill with which the differences of the upper and lower plans are blended, to the well-regulated gradation in dignity of enrichment of the several arms of the cross, and the vigour with which certain well-accentuated lines of decorated detail are carried round the interior throughout at identical elevation, binding all together in unity.

The line of nave, east and west, is well-decided and kept distinct from the north and south arms of the cross under its special dome by the insertion of three columns in the interval, which

carry a connecting gallery only, and for the rest declare themselves simply as standards of a line of demarcation. The moderation of their intervals is moreover most useful in bringing down a scale for comparison of magnitudes; and the space under the central dome gains in magnitude by contrast with the oblongs of the aisles that are so cut off from it.

By a like arrangement in the transepts, the eastern and western arms of their domed crosses are divided from the main transept, running north and south by pairs of columns in opposite sets, bearing a continuation of the galleries which wind round the interior of the small squares of pier-crosses, and so round the church, connecting the covered extremities of both transepts and nave. This passage has thus much analogy to some forms of the so-called triforium, but that it was ever extended, or intended to be across the aisles, I do not believe.

The capitals of these columns are gilt, and very varied in design, but even when not exactly paired, are usually treated with a distinct intention to match in general effect. Some are pretty literally Corinthian, and some Composite, never exactly executed; others belong fundamentally to either one or other of these forms, but betray a definite attempt to work out a novel combination, and usually under a predominant Byzantine feeling. We seem to be provided here with examples of two forms of innovation in style. Innovation is sometimes little better than innovation of malice aforethought, when it is prompted by no welling up of new imaginations, but is a mere assertion of brute independence, a resolution to be different in any case, different for the sake of difference, right or wrong.

It is impossible not to perceive in other cases that it was through the degradation of an originally pure if not perfect form, that novelty has been evolved more honestly at least, and of better promise. A type that might have been fixed and immutable for ever, by the conservating energy of its very beauty, had it never been unworthily executed, has been superseded at last by designs of most contrasted character, that still took their origin from its own debased exemplars. When refined beauty lapses, it may easily be into something worse than primitive crudity; ill executed specimens then become incitements to regeneration, to remodelling that does not retrace the steps of the ages to a departed purity of which the traditions may be absolutely lost, or that otherwise may be too elaborate for resources, for patience, or for skill. Many Byzantine capitals have much the air of being cheap or random completions, one how or another, of capitals that had been found blocked out to receive Corinthian foliage. The attempts of indifferent workmen in this way at last suggested motives that were developed by livelier imaginations, abler hands, but equally exempt by education from reverence for correct classicism. This, however, is a subject,—the transformation of species architectural, that deserves to be worked out independently, and invites abundent illustration; parallel phenomena are to be found in those changes of language by which degraded provincial Latin became the Italian of Dante, the French of Montaigne, while dialects less divergent from their original, remained base Mediæval Latin, or became obsolete.

The columns of the interior of the church, of porphyry, verd-antique, Oriental and African marbles, have invariably monolith shafts, and in their enrichments, as in their ordination, there are but exceptional traces of that irregularity that is so striking in the vestibule and the external porches. In the interior there is scarcely a trace of admission of incongruous associations for the sake of finding a place at any risk for fragments of value in themselves, but with no pretensions to match; here every column and capital has the appearance of having been made for its place, and designed with regard to its associates and its surroundings. The six in the nave proper are of marble, as indeed are most of the rest; but these, in deference to the dignity of their position, are cut in the expensive direction,—transversely to the veining of the stone. The central capitals of the triplets on either side are tolerably accurate Corinthian, and contrast by heightened decoration with their companions on either side, which again match their opposites, but are of style of plainer finish.

Every abacus above the gilded capitals is enriched with an elegant inlaid pattern in black and white; this is continued at the same level round the plain massive piers; it is repeated with extra and very beautiful elaboration above the capitals of the granite monoliths, that are in pairs against the walls and at the angles of the transepts to receive the broad archivolts of the pier crosses; from these capitals the simpler pattern of the nave abacus is continued as a string-course along the walls, and it thus makes the circuit of the entire church,—nave, transepts, presbytery, choir, with a value in effect that is far beyond its immediate conspicuousness.

The positions of other parallel string-courses above are governed by the distribution of the design, as it is shown by a longitudinal section.

It is futile to attempt to follow out the process of distribution of a truly artistic design through one single line of deductions. The very principle of harmonious combinations implies the ultimate concurrence of several motives of arrangement—the equilibration of various concurrent momenta. But the concurrence at last is only brought about by independent examination and pursuit of the tendencies of each; by the discovery of agreements arrived at from different points; by the concession of compromises recognised as unavoidable after scrutiny from most varied aspects. The height of the crown of the central dome from the pavement is as nearly as possible equal to one-half the interior length of the church as already taken; this, however, does not give us the height of the dome itself—the level of the springing of the hemisphere. This is necessarily one-half of the diameter of the dome, of that circle which, as we have seen, is given by one-fifth of the full length or breadth of the church. This agreement, however, may be but an undesigned coincidence, or it may have been considered, and even rendered exact, in consequence of its observed approximation to a dimension brought out by another process. Thus, let us say that the architect decided first, that his greatest interior height should equal half his extreme interior length; by halving this height again we find that our section of the church is again divided into a lower portion, comprising the vertical walls of rectangular outline, and an upper which contains only the vaults, domes, and semicircular heads of walls under the vaults. This line well marked runs through from end to end of the church, interrupted only by the later wheel window of the transept: it is confluent with the abacus of small column of upper story immediately below the spring of vaults and archivolts, and is returned at the eastern end to mark the base of the semi-dome of the grand apse.

The upper division or half is now divided between two semicircles of equal span,—that of the large central dome and that of the barrel vault of the nave below it. That the diameter of these semicircles is not equal to half the height of this upper division is due to the circumstance that a certain space is occupied by thickness of construction between the base of the dome and the intrados of the barrel vault. By making this deduction, on whatever principle, it is clear that we should bring out the diameter of the central dome by reference to the continued bisection of interior length, and irrespective of its division into fifths. The lines of height of barrel vault and dome springing again, run through from end to end of the church, to finish upon the crown of the grand eastern apse.

Thus we have, first, the level giving the base of the domes throughout; then that of the barrel vaults and semicircular archivolts; the joint height of these divisions being equal to one-half the full height of the church, or one-fourth of its full interior length. By halving the height from the base of the dome to the floor, we obtain the line of bases of paired columns that in an upper story carry the archivolts of the transepts of the choir and apse; it is returned round the transepts as the moulding of the balustraded gallery over the arcades, round the tribunes housed within the great piers, and so passes entirely round the church. At one end it accentuates the elevation of the gallery over the entrance, and at the other crowns the lower division of the grand apse above the secondary niches. The proportionate height is continued to the choir, where the raising of the floor below is countervailed exactly above by the thickness of the sub-archivolt.

Apart from the noticed deduction for constructional thickness, it is clear that the height of this division and of the colonnettes it includes would be exactly one-eighth of the full height of the main dome; as it is, they are somewhat in excess of one-sixth of the height of vault of nave, the reduced dimension.

The smaller paired columns upon this level already adverted to, have great merits in themselves, and the highest value in effect. Here again is exemplified most strongly the distinction that must be admitted between the treatment and design of San Marco in the interior and on the exterior. All these columns are alike in design, adjusted originally to the dimensions of their position and of well-studied elegance. Their shafts of dark marble are octagonal prisms, with graceful diminution upwards, and they blend below into an accurately moulded base of elegant profile with an ease that may well put to shame mediævals who never learnt to spare the jar of a harsh transition from abruptly broken shaft to base-moulding.

The abacus is rectilinear in profile, and the intermediate capital, of uniform type in every case, and of very decided Byzantine character, is accommodated to the outline of the shaft by cutting off the angles of a cubical block from the corners of the abacus above to a line matching the inclined side of shaft below.

The more numerous and closer introduction of the colonnettes in apse and presbytery assists very greatly that effect of gradual focalization of interest that is favoured by general increased enrichment ensuing upon contraction of the general spacings and rise of level upwards to the eastern extremity.

This line, then, coincident with their capitals, and at exact midheight between pavement and springing of cupolas, marks the lower point of the pendentives under all the domes, and the limit of the vertical piers and sidewalls throughout the church; and its importance is acknowledged accordingly by a white marble moulding, richly carved, but still of no such projection that it may not consistently be returned as an abacus moulding above the capitals of smaller paired columns that on the upper story bear the advanced archivolts.

The line of the bases of these small columns gives another continuous division marked by a light plain moulding of small projection; it is continued below the vertical windows of the apse in one direction, and in the other it is returned round the transepts as the moulding of the balustraded gallery over the arcades, and so it reaches ultimately the like position above the arcades of the nave, and the tribunes housed within the great piers.

This is the leading line that determines the distribution of the gorgeous internal enrichments of the church. The soffites of the arches of the arcades are indeed enriched with mosaics of figures, compositions, and patterns; but except for these, and a few figures on walls of the nave aisles, the enrichment up to this level throughout the church in nave and transepts, depends entirely on incrustation with long vertical slabs of veined marble returned symmetrically upon their sections. The general character and tone of colour of these is pretty uniform, and has a certain warmth that is not inharmonious; besmirched, however, as the entire surface appears high and low wherever not brightened here and there by attrition of heads or shoulders of worshippers, the original tint may easily be misinterpreted through adventitious dinginess. The comparatively plain yet not neglected walls, only broken and relieved by the attached and intermediate shafts, are thus interposed between the elaborate Mosaic pavement of the floor, and the gleaming and storied walls of the upper story above the level of the galleries, and then of the vaults and archivolts, the pendentives, and the domes. We must reserve the remainder of our observations for another article.

MEMORIAL OF THE LATE HENRY KIRKE WHITE.

THROUGH the earnest efforts of the Rev. E. Davies, rector of Wilford, near Nottingham, which place was the favourite resort of Henry Kirke White, a memorial of the youthful poet has, at length, been placed, by public subscription, in the chancel of Wilford Church. The memorial consists of a painted window, illustrating Kirke White's ode, "The Star of Bethlehem," which has been produced by the Messrs. O'Connor; and also of a medallion portrait of Kirke White, sculptured in white marble by Mr. W. T. Hale, of London, and which has received approval for its truthful resemblance to the existing portraits of the poet.

THE BIRMINGHAM AND MIDLAND BANK.

WE publish a view and plan, in our present number, of the Birmingham and Midland Bank, which is now in course of completion.* The commercial needs of the great midland metropolis have induced the proprietors of the chief banking establishments to rebuild or extend their premises, and amongst the foremost in taking that step were those of the Birmingham and Midland Bank, whose offices in Union-street have been enlarged from time to time till, more accommodation still being required, the directors wisely determined to build on a more extensive site more convenient premises fitted with recent improvements.

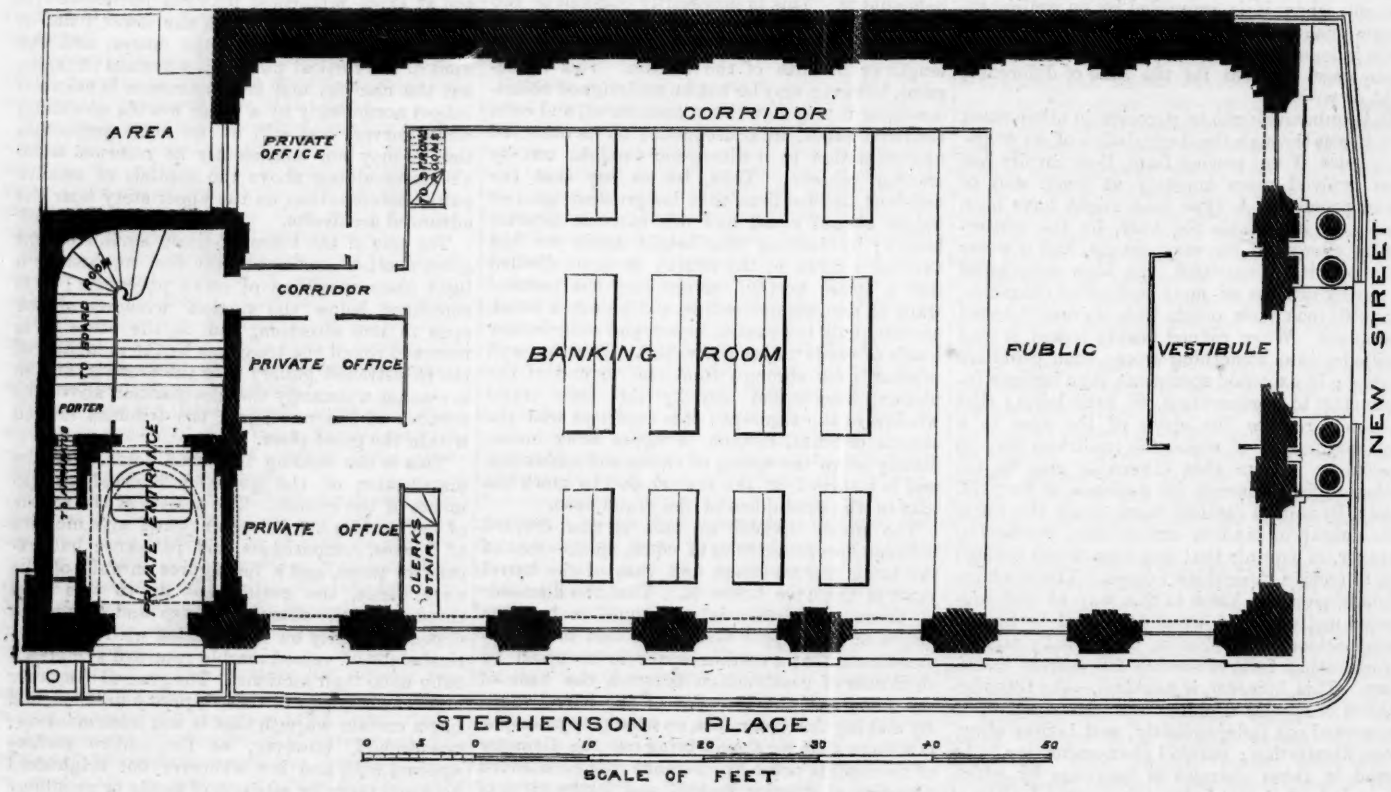
The building is from the designs of Mr. Edward Holmes, of Birmingham and London, and stands at the junction of New-street and Stephenson-place, opposite the Exchange Buildings, which were erected from the designs of the same architect, and illustrated in our pages a few years back.

* See p. 47.

As will be seen on reference to the plan, the whole of the site, with the exception of the private entrance and stairs to Board offices, is occupied by the banking room, a fine apartment 92 ft. long, 49 ft. broad, and 30 ft. high, the private offices being shut off by screens of polished mahogany and embossed plate-glass. In addition to nine lofty windows, a central lantern gives light to the bank. This lantern is 37 ft. by 18 ft. 6 in., and is filled with ornamental glass by Messrs. Chance, Brothers. The strong-rooms, with the dining and coat rooms for clerks, occupy the whole of the basement, which is well lighted. On the first floor are placed a board-room, 48 ft. long, 26 ft. 3 in. wide, and 25 ft. high, with windows in both fronts, and ante-rooms, dining-room, sitting-room, and bed-room for resident clerks, lavatory, &c. There is a private room for the manager on the Mezzanine floor over the private entrance, and a gallery which may be used for clerks over the private rooms at end of bank. The second floor, lighted from the roof and from area for central lantern, is occupied by the kitchen, offices, and bed-rooms: a light from coal-cellars communicates with the former. The upper stories are carried by wrought-iron large box-shaped transverse and longitudinal girders, each of the transverse girders weighing about 18 tons.

The style of the building speaks for itself: it is somewhat severe in character, the architect being instructed to avoid all unnecessary ornamentation, but the result is an edifice at once dignified and bank-like. The two fronts are executed in Portland stone, the four columns of the portico being of Cornish grey granite polished, each a monolith. The walls internally are finished with Martin's cement. The ceiling is divided into nine compartments, round each of which there are cornice and cove: each division is coffered. The bank fittings are of polished Spanish mahogany. The private rooms and board-room are being warmed with hot air by Mr. W. W. Phipson, C.E.; the massive iron railings are in the hands of Messrs. Hart & Son; and the other works have been carried out under the direction of the architect by the contractors, Messrs. J. Cresswell & Sons, of Birmingham.

THE BIRMINGHAM AND MIDLAND BANK.



Plan of Ground Floor.

A PLEA FOR STONE.

AMONG the theories set up by sundry architectural prophets, upon which to ground the formation of a new style, and indicate with precise and irrefutable logic the form which such style must take, the most prominent is that which takes for its basis the comparatively recent introduction of iron as an important constructive element in building. We have had this view of the matter, in fact, dinned into us *ad nauseam*. All young lecturers and readers of "papers," who wish to appear very philosophical, tell us that this is the "iron age," a metaphor which seems inexhaustibly attractive. "A pound of wire will do as much as a ton of stone;" we are to have no more such wasteful and clumsy expedients as arches and abutments. Tension, tension is the thing. According to a well-known and very clever writer, the lintel and the arch styles, representing cross-strain and compression, have had their day, and the *tensile* style is the style of the future. We have no intention here of "setting the battle in array" upon the question of our future style. Heaven forbid that we should add a line to the reams of theorising which have been written on the subject. To us, indeed, one building carried out with thorough honesty and straightforwardness as to material and design is worth more than a whole shelf of books of prophecy. But one can understand how comforting it must be to the minds of a certain class of designers to have a neat concentrated theory upon an apparently practical basis; and how exhilarating must be the visions conjured up of all the new and elegant forms which building design is to take after we have become naturalised with the new material, and have made it as important an element in architectural history as stone was made by our forefathers. And even if we decline to contemplate the possibility of a purely iron style, still, if we are to accept Mr. Garbett's tensile style of arches without abutments, it is clear that iron must play the most important part in the practical construction thereof, and a millennium for the ironfounders be the inevitable result.

Our ironical anticipations on this head, however, were rudely interfered with the other day by the contemplation of a small piece of iron 2 ft. long, which some years back had been inserted in the masonry of a spire when under "restoration," to tie one of the angles at a weak point; that is to say, the material was stated to be iron by those who were bound to know—a statement which, in the face of the unsightly ragged mass of oxidization presented to us, had to be accepted in faith only. Of course, it has been a currently admitted fact for some time past that iron is very unsafe material to use in conjunction with stone, and that under such circumstances it is always liable to go; in fact, that in admitting iron into masonry you are introducing an element of decay, or even of destruction. Yet this knowledge is very often set aside and practically ignored. We are acquainted with one church built by an eminent architect, and deservedly an object of admiration in its neighbourhood, the "crossing" of which professes to be covered by a solid stone dome springing from four main piers. It was originally

intended to be so, but (being in the confidence of the contractor) we obtained the information that the pendentives were in fact supported by iron girders across the angles, concealed in the masonry. We represented that this was, in fact, tying an edifice up, not *building* it, but were met by the assurance that the girders in question would last "till the millennium;" which, not knowing the date of that era, we could not dispute. But, waiving the question whether such proceedings are really in accordance with the art of architecture properly so called—whether it is not a very lame and mean sort of expedient to represent a building as constructed of masonry when, in fact, it is supported by concealed bandages of a tensile material—what we wish specially to call attention to is the fact that iron, even when used in the most favourable positions, and with the greatest care to exclude from it the action of weather, has not yet had the test of time to determine its capabilities of endurance as an architectural material. It is very well to talk of an iron style, and to declaim against the prejudices of those old-fashioned people who look cautiously askance at the idea; but it must be remembered that it has heretofore been one of the chief glories of architecture as an art, one of the qualities which render it in its highest forms most attractive to the best minds that have been engaged upon it, that its productions have been more or less monumental in their character, and have claimed both by their magnitude and stability a kind of dignity and importance on the earth beyond that which attaches to smaller and more perishable works of art. Now, even setting aside the question of artistic appearance, we have no proof as yet that structures principally or wholly of iron will last in this way as monuments to future generations, since time is the only test in such matters; but, from what we know of the material, we have every presumption that it will not so last. Knowing as we do the rate at which iron gives off its substance in the form of rust, a source of decay which becomes more felt in proportion to the increase of external area; knowing the extent to which it alters its conditions under change of temperature, and the difference of the conditions of wrought and cast iron in this respect, which yet must often be used in conjunction; remembering also the thousand and one weak points which are liable to make themselves felt in a structure all the parts of which have to be joined by bolts, screws, and such-like contrivances; under all these circumstances, it is impossible not to feel that the claim for iron as a leading material in the architecture of the future is even practically a very doubtful one, and that buildings dependent in any way on such a material, though invaluable for temporary purposes, must lose nearly all that enduring character once supposed to belong peculiarly to architectural designs, and have small chance of carrying down the memory of their designers to posterity.

Nor is the case for stone, as against iron, less strong in an æsthetic than in a practical point of view. Consider for a moment the remarkable distinction between the *rationale* of the two materials. They do not stand by any means on the same footing. In using iron, we are using a material which is to some extent artificial. It does not show itself above ground; and when it has been laboriously dug up and brought to light, it is not in a state for use, or even recognisable at once by those who only know it in its artificial state; nor is it till after much mystery of smelting, puddling, and other treatment known to the initiated, that it comes forth "purified and meet for the master's use." But in using stone, we are using a natural material in its unaltered state, so far as texture and quality are concerned,—a material concerning which we have had previous experience, before we used it, of its powers of resistance. We see it before us in the quarry, cohering in vast masses, and resisting a compression of many tons, and we take it as it is, merely cutting it to the required sizes, and set it, as it lay before, "on its quarry bed" (if our clerk of the works attends to his duty properly). We expose a great amount of its surface to the weather; but otherwise, if our building is properly constructed, we do not alter the condition under which the material existed in its natural state, and consequently are saved much of the doubtful and experimental proceedings which are forced on us in dealing with artificial materials. A more important consideration, in an æsthetic point of view is, that we are here using the material which we see visibly around us, which forms part of the ground we tread; we are causing the "great globe itself," visibly and ostensibly, to furnish the means whereby we may erect those "cloud-capped towers, gorgeous palaces, and solemn temples" which have formed some of its noblest adornments. It is this which has given much of their impressiveness and effect to the great monuments of the architecture of the past; that they have appeared not so much as independent erections or constructions upon the earth's surface, as actual growths from it, homogeneous with it in substance and texture; and thus appearing to form part of the landscape amid which they stand. Sir Charles Barry, indeed, is known to have made this latter effect a special object whenever circumstances permitted; his delight having been to "connect the house with the landscape," by happily-contrived terraces and gardens, diminishing in artificiality as they receded from the edifice and mingled with the open country. Nor can we ignore the immense value of the mass and weight of material necessary to a stone building, and necessarily precluded in an iron one, when architectural effect is to be considered. After deducting all the effects of previous habit and prejudice, after allowing that a nation long habituated to seeing its principal structures of iron would come to look on that material with far more respect than we now do, and become used to its rigid lines and thin forms, it is nevertheless impossible for a moment to admit that structures resting upon thin metallic shafts and roofed with a web of spider-like framing, can ever have that effect on the mind which has been produced upon all beholders by the temples of Karnac and Philæ, the Parthenon, and the great cathedrals of the middle ages. In the "iron age," all that has constituted the majesty of architecture would disappear. That aspect of enduring immobility, which seemed to connect the structure with the ground it stood upon, the broad play of light upon the piers, the depth of shadow in recesses and roofs, the aspect of mystery which pervades a grand interior on a large scale—all this would go, and leave us instead a barren framework of thin lines, standing nakedly out, devoid of all the magic of chiaroscuro, and suggesting nothing save economy of space and material. Unless architecture is to be a lost art, stone must still be the main material for the architect to work with.

Brickwork has indeed been putting forward great pretensions of late, and, in buildings where economy has to be considered, must always take precedence of stone; but we have instances, not a few, of late years, in which brick has been, and is being, voluntarily preferred for large and expensive churches, and buildings of a similar class. We take this to be a foolish piece of fashion; a change for the sake of change, or in the vain hope of thereby achieving originality. All our church architecture having for so long, more than any other branch, run into copyism, the original models have been exhausted, and the copyists were at a dead lock, when the lucky discovery was made that the Mediæval builders of the North of Italy had produced admirable structures, after their manner, of brick and marble, to the adequate illustration whereof one of the most talented English architects lent himself with a will. Here was a new field; the marble, indeed, might be difficult to obtain, but the brick was feasible; whence a springing up of brick churches, as aforesaid, with square jambs in lieu of splays or mouldings, and traversed by divers bands of black. This may be all very well for a change, but as to appearance there is no comparison, except in the eyes of prejudiced persons. It is very difficult to get brick of a decent colour at all for a large building, and when the best is obtained, it is far inferior to the natural tint of fresh stonework; and being an artificial tint, moreover, does not harmonize with the landscape around it: while the forced and strongly pronounced polychromy obtained by different tints of brickwork is far inferior in effect to the natural play of colour and tone in stone walling. Then carved ornament cannot be introduced, except by the insertion of stone in which to carve it; though the enthusiasm of some of these modern "bricks" has led to the resuscitation of moulded ornament in brick,—a device which costs nearly as much as stone carving, without having one-fourth the effect, and which was originally used in localities where no stone easily carved was procurable, but which is now voluntarily substituted for freestone, where the latter is plentiful, merely for the sake of fashion. Of course, good brick is a very fine material where expenditure must be limited; what we protest against is the pretence of preferring it to stone on artistic grounds. And there is one very strong reason for using stone, when building in the country, even for small houses, viz., that it can be made to harmonise with the landscape of the district in which the house is erected. In introducing brick into a landscape, we are in almost all cases introducing a discordant element of colour. But in using (as should always, if possible, be done) the stone of the neighbourhood, not only are we using, as before said, a natural instead of an artificial material, but we are using that which is the basis of the landscape around, and from which the latter takes its prevailing tone and character; whether it be a limestone or a sandstone district, or whatever formation it may be, we are thus carrying the tint and character of the landscape into the walls of our house, which seems to become part and parcel thereof. This is not sufficiently attended to; and sometimes stone is brought at additional expense from a distant quarry, to satisfy some whim of the architect, when the stone of the neighbourhood would have had a far more satisfactory effect in comparison with the surroundings of the building.

In making this plea for the use of stone as *par excellence* the architectural material, we may be met by the objection that the order of things, and consequently the tenure of building property, is no longer characterised by the same stability which belonged to ancient periods, when the current of life moved at a slower rate, and when the uses and requirements and value of a building did not change for centuries after its erection. It may be said that we have no longer occasion, in our towns especially, for those monumental structures which seem built to last for ages, seeing that we know not when the demands of a shifting and increasing population and a changing polity may render such edifices, after a comparatively brief time, no longer suitable or useful. But the idea arises from a too partial view of the course of human affairs. As Mr. Froude observes in the opening of his "History of England," the history of nations has always presented an alternation of epochs of change with long periods of settled and established ideas. We are now in a period of change; steam has revolutionised our domestic polity, and some time may elapse before we settle down into the new form of life and manners towards which we are, however, rapidly moving. It may be wise, therefore, not to stereotype any of our present wants or partialities in the form of expensive buildings of a monumental and enduring character. We are now in the condition of the man described by the Roman satirist:—

"*Diruit, ædificat, mutat quadrata rotundis.*"

We are changing our forms of building and our forms of life, and the iron architecture does well enough for the temporary needs of such a period of change, and will last about as long as it is likely to be wanted. When we shall have settled alike our great lines of railroad and our great lines of life, and grouped our habitations accordingly, we shall once more find stone the fittest and best exponent of an architecture which we may trust will not be inferior to that of the great periods which we have left behind us.

A FRENCH BOOK ON HEATING AND VENTILATING.

THE author of a treatise upon heating and ventilating French private houses and supplying them with water, recently published in Paris, cries out bitterly against the prevailing system of false luxury in French houses, which provides appearance before comfort.* Every sanitary arrangement, he declares, is sacrificed to secure handsome reception-rooms, which give to their occupant a semblance of being something more than he really is; and if the architect entertain any other consideration, it is how to impart an air of luxury to the façade. Where an English landlord advertises, "Well-aired beds," a French one announces "*Appartements ornés de glaces.*" M. Joly, the writer in question, has made a long residence in foreign parts, "where taste is sometimes at fault, but where domestic comfort is studied better than in France," which we presume he is too polite to name more particularly. But it is easy to see that it is with

* Traité Pratique du Chauffage, de la Ventilation et de la Distribution des Eaux dans les Habitations particulières: à l'Usage des Architectes, des Entrepreneurs, et des Propriétaires. Par V. C. Joly. Paris: J. Baudry, 15, Rue des Saints-Pères. 1869.

the widely-spreading adoption of sanitary appliances in English houses that he contrasts the almost utter absence of water and ventilation in French habitations. In his enumeration of what he calls the vice of French domestic buildings, he speaks of low ceilings, of water-closets badly lighted, badly ventilated, and placed close to the kitchen; of the absence of ventilation, baths, and water; of nurseries looking upon the unwholesome courts into which the spouts carrying away the foul waters of the house discharge themselves; and of chimneys which waste the heat they should economise, as evils the French tolerate with complacency, if not with approval; and after dwelling at some length upon the discomfort and misery of these shortcomings, he strenuously urges the adoption of the habits of "propriety" common to the English, Dutch, and Americans. Posterity, he continues, will be scarcely able to believe, that in Paris, the eighth wonder of the world, men and women can be seen at the present day *attelés à des tonneaux*, and carrying water upon their shoulders to the upper stories of houses. Cold water within the last few years has found its way into French kitchens, but hot water is still unprovided there, and both are entirely absent in the upper stories, as is the health-giving bath. A French bed-chamber, he deplores, let it be ever so richly decorated, contains only a bed, a secretaire, and a few chairs: no convenience for the performance of ablutions is in sight. He would have a bath at the side of the bed, a choice of site we cannot endorse, however much we approve of the general use of this source of cleanliness and health. A bath in a bedroom is a mistake, because the steam from the hot water is a source of damp to the bedding. It is much more advantageously placed in a room opening out of the sleeping apartment, when, by the simple plan of closing the door between them, the steam is confined to the bath-room. Having shown the great desirability of more attention to sanitary matters, especially the need of a proper water-supply in French private houses, he first points out the best methods of carrying the last-mentioned reform into execution, after owning that learned engineers have spent much time in disentangling the difficulties of providing water, ventilation, and heating for barracks and prisons, and adding, "Thanks be to Heaven, every one does not live in these," as a reason why private dwellings should also be considered. He next turns his attention to the best modes of heating and ventilating, illustrating his subject with upwards of a hundred and fifty diagrams, and supplementing it with a list of the principal works relating to it, dating from the year 1460. Each division of these important measures is minutely treated; for instance, water supply is discussed in its various stages of collection, filtration, distribution, heating, purification, and utilization; and its application to baths is shown in views and sections embracing the modes in use in ancient Rome and Pompeii, as well as in England and America at the present day. He terminates his description of the different systems of heating baths with an account of that which he calls French, because he has not seen it in use elsewhere, and, he says, it seems to him admirably adapted to the many-storied French houses. This is merely the plan which utilises the surplus heat of kitchen or other stoves instead of wasting it. The reservoir of water is furnished with a number of pipes, through which the waste heat from the stove, generally the kitchen stove, circulates, and these heated pipes raise the temperature of water in which they stand to their own. In summer, when large fires are not so certain to be in constant use, gas can be applied with equal facility to the same apparatus.

M. Joly's chapter on the heating of apartments is agreeable reading, for it treats the subject cosmographically, if we may say so, and is rich in illustrations of the stoves of the world. Chinese, Persian, ancient Roman, and Mediæval heating contrivances are well represented, as are the more modern Continental stoves. He names as the best kinds in use in France those known by the names of their inventors, as "l'Appareil Fondet" and "l'Appareil Mouseron," both of which are furnished with hot-air chambers. A third management of the means at disposal may be described as an ordinary wood fire upon the hearth, the smoke from which ascends an iron pipe in the chimney-flue, leaving the extra space in the chimney as a chamber in which external air is heated by the pipe, and made to distribute itself into the same room in which the fire is placed, near the ceiling, by orifices provided for the purpose. Heating by water is only used in France in greenhouses and hospitals.

Ventilation is treated by M. Joly as the twin-sister of heating. He gives the preference to natural ventilation, but enters fully into the various artificial means, as well as into the history of *l'aération*. The ventilation of mines first occupies his care, thence he passes to that of hospitals, and thence to that of churches, theatres, salons, concert-halls, schools, and buildings of many stages in height, successively, the various systems being clearly illustrated. We pick out for especial mention a plan for warming and ventilating a building of the last-mentioned class, which resembles in its most essential features one recently illustrated in these pages. M. Joly shows a four-storied house with a basement, in the centre of which is placed the heating apparatus. There are three ventilating shafts in communication with the *calorifère*, one ascending straight up from it through the entire height of the house to the outside of the roof, the other two being placed on either side of it, at some little distance, so that they pass through the rooms to the right and left of those in the centre of the house before passing likewise out of the roof. At every ceiling there is an opening into one of the shafts to carry off the vitiated air, and in each room near the floor there is another opening, through which hot air, conveyed by pipes from the central apparatus below, is introduced into it. Like others, M. Joly urges that the most simple, economical, and effective way of ventilating a private house, both in summer and winter, is to imitate the method used by Nature for the circulation of the blood in the human frame; that is to say, to place the moving power and principal arteries in the centre, with branches directed towards the extremities. In a house the principal artery should be a shaft in some useless angle of the staircase, as near as possible in the centre of the building. This would be the seat of the circulation of the air of the interior. Hot-water pipes ascending from the basement for the service of the rooms above could be also placed in it. If the waste heat of the kitchen fires was not available for the displacement of air in it, a stove could be placed at its base for the purpose, which could be further utilized by making it heat a circulation of water that could mount to the top-most floor, and serve the baths and lavatories upon every story on its way up. In a section devoted to a consideration of the ventilation of the rooms occupied by working men, the author asks whether their case should not be thought more of than that of criminals, for whom so much trouble is taken in the ventilation of prisons. After picturing the upright workman coming home to his modest habitation, which is probably without water, ventilation, warmth, and salubrity, he suggests that in those instances where his house forms one of a row adjoining a factory, there should be a vast horizontal conduit running through it and the rest, carrying into each chamber fresh air in summer, and hot air in winter. This plan has been pursued by some manufacturers, who have been recompensed by the vigour and activity of their workpeople, as well as by the decrease of cases requiring pecuniary assistance. When the house is not so situated he recommends another cheap plan of securing fresh air and heat, which appears to be an exceedingly ingenious one. Taking it for granted that the workman will have a stove and not an open fire, he says this stove should have suspended over it a small iron-plated and tinned reservoir or cistern, which is to be heated by the smoke, and by a circulating boiler. The flue of the stove on its arrival at the ceiling ought to find there an enlargement or opening, in the middle of which the smoke-tube is to pass out, the remaining space being filled with a moveable register, shut when the fire is alight, but open throughout the night. The disadvantage of turning flues into ventilating shafts with us is the descent of soot. With wood fires this might not be so insurmountable; moreover, the pipe for the smoke, made perhaps of glazed earthenware, might be carried up the full height of the flue, where there could be no deposit of any kind in the latter. This is not the only ingenious contrivance urged upon French landlords. In conclusion, M. Joly observes progress is slow, especially in a country like France, full of routine; but it is sure; and what is a luxury for the few to-day will be, in twenty years perhaps, a necessity for every one. We commend his work: it is comprehensive as well as forecasting.

THE LATE MR. GEORGE SMITH, OF MERCERS' HALL.

WE mention with regret the death of a much-respected member of the old school of surveyors, Mr. George Smith, which took place on the 5th inst. Mr. Smith was born at Aldenham, in Hertfordshire, on the 28th September, 1783; came to London in early life, and was afterwards articled to Mr. Brettingham. We have heard him remark as a curious fact, that he and another pupil were the only students there who afterwards followed the profession, the rest having joined the army. He afterwards went as clerk to Mr. Alexander, and was largely connected with the dock business; subsequently he was with Mr. Beasley, a relative of the late Samuel Beasley. Mr. Smith eventually settled in London, living in the neighbourhood of St. Paul's, and quickly came into a large practice.

He was appointed district surveyor of the southern division of the city of London, in the year 1810, an appointment he held until the time of his death; being, we have heard, the second surveyor who had held the appointment since the passing of the Building Act. In 1814 he was elected surveyor to the Mercers' Company, and held this appointment also to the time of his death.* He formerly held the appointment of surveyor to the Coopers' Company: this he resigned to take his place on the court, and he served the office of master twice. Mr. Smith was a very early member of the Royal Institute of British Architects; became a member of the council; and was the appointed chairman of the committee who drew up the report on dilapidations.

During his time he was much engaged in the heaviest references, in connexion with his old contemporaries Roper, the elder I'Anson, Montague, Higgins, and some more, who have all passed away, as well as with Mr. Lockyer, Mr. Ifold, and others, still pursuing an active career. Among his works as an architect, may be mentioned St. Paul's School, the New Corn Exchange, the tower and entrance of the old Royal Exchange; the Whittington's Almshouses, at Highgate, for the Mercers' Company; the church in Blackheath Park; Hornsey Church, except the tower; Gresham College; Mercers' School; and numerous private residences. He also made the designs for Salters' Hall, we are told, but with right consideration declined to carry them out, and insisted upon the company's own architect being employed. He was a member of the Surveyors' Club from the year 1807, and a trustee of their charitable fund. He was also a Fellow of the Society of Antiquaries, and connected with some other public bodies. A few years ago he married a young wife, who, however, died before him, and he had recently built for himself a house, "Newlands," at Copthorne, in Sussex.

THE EDINBURGH MEDICAL HOSPITAL.

EDINBURGH is at this moment in a sort of fever about the rebuilding of a medical hospital. It appears that the ancient institution which has flourished now under the name of the Royal Infirmary for a period of nearly two hundred years, has survived its usefulness, and has become antiquated. What is more, it turns out to be positively injurious to the health of the unfortunate patients who are forced to seek admission within its portals. Notwithstanding the most strenuous efforts to improve it and add to it, the original defects of its construction appear to be incurable; it has been tried in the balance of hospital statistics, and found wanting; and during the course of last year it was formally condemned by the proper authorities, and ordered to be razed to the foundation. Of course, as a necessary consequence, a new hospital has to be built; and on this question we may say a few words.

It is hardly necessary to tell our readers that Edinburgh is the seat of a most ancient and celebrated medical school. Genoa is not more distinguished for its velvets, nor Lyons for its silk manufacture, than Edinburgh is for the profession of medicine. It may be added that in a city from which all political and even literary glory has gradually departed, the profession of

* His very active partner, Mr. George Barnes Williams, who, first as clerk and then as partner, has been connected with the subject of our notice for the last thirty years, and for some time past has done all the work of the company in consequence of Mr. Smith's failing health, is a candidate for the appointment, and would seem to have strong claims to support in his application.

such a school of medicine is not to be disregarded. To do them justice, the citizens of Edinburgh are in nowise guilty of neglecting this circumstance; and accordingly they have entered heart and soul into a movement to provide the necessary funds for erecting a building worthy of the city and the profession. Upon the Medical Hospital, of course, the wide reputation of the Edinburgh Medical School is based, has been reared, and will, no doubt, be extended; it is in fact, if we may venture to use an old metaphor, the corner stone of the building.

The doctors, as far as we can discover, were the first to complain of the present building. This was, indeed, no more than their duty; but the most important initiative steps in the work were taken by the citizens themselves. During the month of April last year a great public meeting was held in Edinburgh. The Lord Provost took the chair. Lord Dalhousie, Lord Haddington, Lord Polwarth, the Lord Advocate *in esse* (Gordon), the Lord Advocate *in posse* (Moncrieff), the President of the College of Physicians, and the President of the College of Surgeons, together with an eminent publisher, Mr. Boyd, and a famous paper-maker, Mr. Charles Cowan, addressed the meeting. It was announced that 100,000*l.* was the sum needed; and of this sum the managers could supply 40,000*l.* from their own funds, chiefly derived, it would appear, from former legacies. The response was hearty and immediate: 25,000*l.* were subscribed on the spot. An influential committee of citizens was appointed to conduct the public subscription. A benevolent widow lady, Mrs. Buchanan, of Moray-place, first of all contributed 1,000*l.*, and then soon afterwards amended her donation to 5,000*l.* The Earl of Moray gave 1,000*l.*, the Earl of Wemyss also gave 1,000*l.* There were in all ten names followed by the same magical complement of one numeral and three cyphers. The high constables undertook a domiciliary visitation of the working-classes, who, to say of them what is only fair, have always been faithful supporters of the institution. Collections were made at the same time in those curious brass plates which stand on tripods at the doors of the city churches, and the result of this and more was, that towards the end of July the sum of 67,000*l.* had been raised, which sum, added to the 40,000*l.* we have mentioned of Infirmary stock, make up 7,000*l.* more than the stipulated capital required for the rebuilding of the new hospital. We cannot tell as yet how far this continued appeal has met with success, for the subscription is still in progress.

Hitherto "the movement" had been one of uniform success, peace, concord, and good-will. But we must now turn over another leaf in the history; and this, we are sorry to say, is by no means so full of sunshine, or rather of azure and gold. The best of "movements" somehow or other never will run smooth; the apple of discord is sure to fall to the surface sooner or later; and in the present case the split has arisen on the question of *site*. This is a vital question, and its importance cannot be over-estimated, but the considerations which should determine it are so simple, the condition so elementary, and the necessities so easily understood, that we are totally puzzled to discover the reasons for such a stormy and protracted warfare as it has caused in the newspapers and public meetings of Edinburgh. It may be desirable to explain here that the Infirmary of Edinburgh consists of two hospitals, the medical and the surgical. The medical hospital is the ancient institution we have referred to above, and the *locus* of the surgical consists partly of the old High School of Edinburgh and partly of a comparatively new suite of buildings which were erected in the year 1852. The old High School contains the wards and class-rooms of Professor Syme; the new buildings those of Professor Spence. Further, it may be added that this noble charity is under the management or supervision of a board of directors, partly elected annually from the body of contributors and partly composed of the Lord Provost and magistrates, who are managers by virtue of their office. The duties of the managers seem to be rather indefinite. But to proceed: the gentleman who played the part of the Goddess of Discord on this occasion was Professor Syme, a surgeon of long practice and high standing, who honourably fills the chair of chemical surgery to the university of Edinburgh. On the 16th day of November last year he addressed a circular letter to each of the subscribers; and in this letter he asserts, and ably supports, the six following propositions:—

"1. That the managers had resolved to spend nearly the whole of the money in the purchase of property adjacent to their own, 60,000*l.*

2. That they had also resolved to rebuild the medical hospital partly on its present site and partly on the site so acquired, which consists of the shops and houses in South Bridge, facing the college gates.

3. That a larger, healthier, more salubrious, and cheaper site could be got in the grounds of Watson's Hospital.

4. That the managers only proposed a new *medical* hospital.

5. That there was as much need, if not more, for a new *surgical* hospital.

6. That if the new infirmary be erected on the present site, all the existing buildings must be removed before the foundation-stone could be laid. In that case, Edinburgh would be without a hospital for at least three years."

We will only quote two sentences from Professor Syme's argument under his fifth proposition, in order to illustrate their character:—

"Although the ordinary surgical wards are not so bad as they were, still that terrible *pyæmia*—the scourge of unhealthy hospitals—is distressingly frequent, together with other indications of imperfect ventilation. . . . . It is therefore with no pleasant feeling that I receive the visits to our hospital so frequently paid by members of the profession from all parts of the world, who must necessarily make injurious comparisons of the spacious, convenient, and well-ventilated wards seen elsewhere, with the mean, rambling, and altogether incoherent arrangements of our surgical department."

It is hardly necessary to say that this letter made at once a powerful impression on the contributors and the public. We do not see how it could operate otherwise; for the facts seem to us indisputable and the arguments unanswerable. But it is an unfortunate characteristic of our medical schools, that their doctors differ in their opinions, and still more in their practice. Edinburgh, we are sorry to say, is no exception to the rule. Indeed, if we are to credit all we hear, we believe that diseases of the antagonistic and pugnacious type break out there with uncommon virulence and intensity. Since the days when Dr. Sangrado pulled his opponent's ears there has been no such scene witnessed as one professor of the same college publicly burning the pamphlets of another professor in his class-room. Our readers, therefore, will not be astonished to learn that within a week another doctor of the same school, Professor Spence, professor of surgery proper, also published a letter in reply to that of Professor Syme, in which, if not with equal skill, at least with more command of statistics, he urged the following counter-propositions:—

"1. That Professor Syme's letter contains statements regarding the sanitary condition of the surgical hospital which, if allowed to pass unchallenged, must prove injurious to the reputation of the institution, and of the medical school of Edinburgh.

2. That he [Spence] knows these statements to be incorrect as regards the department under his charge.

3. That he, as the senior acting surgeon of the infirmary, had never made or joined in such complaints; neither had the acting surgeons as a body.

4. That he had had actual experience in every ward of the surgical hospital. Professor Syme never had had charge of any one of them. He might, therefore, feel justified in calling in question his (Syme's) competence to pronounce an opinion.

5. That the statistics of amputations for disease during a quinquennial period in the published reports will compare favourably with those of any great city hospital.

6. That he holds strong opinions as to the advantages of the present site."

We have no room, even if we had the inclination, to wade through the terrible mass of newspaper controversy which followed on these rival letters,—

"Strow'd were the streets with milk-white reams,
Flow'd all the Canongate with inky streams!"

All the great Edinburgh writers—medical, legal, ecclesiastical, mercantile, economical, municipal, and architectural—seem to have exhausted their wit and invention in fetching arguments and digging up sites. One writer recommended that the hospital should be put beyond the boundaries of the city, after the fashion of the ancient Jews, —and very wisely too. Another suggested the city poor-house; a third, the cattle-market; a fourth, George Heriot's Hospital; a fifth, the Queen's Park. One doctor, obviously half-eccentric, proposed an iron bridge over the Cowgate to a site among the lowest slums of the High-street; and another doctor of equal eminence proposed that there should be no hospital built at all, only a provision of movable pavilions constructed with cast-iron plates. The medical profession, as far as we can judge, are about equally divided in their opinions; and, in fine, the question as between the two professors is substantially unaltered. But when doctors disagree, who shall decide? We need not venture to answer the question. With regard to public "movements" of this sort, the proverb is something musty. The science of public health, for example, is perhaps more indebted in our generation to the engineer than the physician; but, at all events, no man in his senses will be governed in his opinions by the statistics of one department of a hospital. Professor Spence's statistics may be, and are, doubtless, correct, so far as they go. But no statistics in the world will make a plain man believe that the site of Christ Church Hospital, in Newgate-street, is as salubrious as the site of St. George's Hospital at Hyde Park Corner. And such—or nearly so, we believe—is the analogy between the present site of the Royal Infirmary at Edinburgh, and the site which Professor Syme recommends at George Watson's Hospital, which lies with a southern exposure, on the northern slope of the Edinburgh meadows. We cannot choose but support the view which gives the suffering inmates of a hospital the chances of more sunlight, better ventilation, and purer atmosphere.

We hear that Mr. Bryce, the architect to the Royal Infirmary, has been requested to report on the comparative merits of the two sites. This ought to have been a preliminary step. It is unfortunate that the managers have lodged their bill, and scheduled the property on the old ground, without the least reference to another and, it may be, improved site. However, better late than never.

COLOGNE CATHEDRAL.

It was not until the spring of last year that the works and restorations upon other parts of this venerable pile were thought sufficiently advanced to allow of some progress being made with the two western towers; and this being at length determined upon, much had to be undone in consequence of decay, and other reasons, before the work could be satisfactorily proceeded with. Mechanical appliances were for the most part as uncouth and imperfect in the middle ages as they probably were in the time of the Egyptian Pharaohs. In those days it was the work of an entire day to raise a block of stone weighing some 40 or 50 cwt. from the ground to a height of 100 ft., and this was mostly done by soldering a powerful ring into the stone and raising it by means of a huge crane to the top. Some twenty stones have thus been found upon the northern tower of the "Dom," each still provided with its lifting-ring, which it was not thought worth while to remove at the time when the works were stopped. Last spring the task of completing the towers was put in hand, the first thing to be done being to remove the time-honoured ponderous old crane we all know so well, if not from an actual visit, at any rate from all the Eau de Cologne bottles we have ever seen. All joints, mortises, and joggles, were found utterly rotten, and a special scaffolding was necessary to take down the huge timbers that once had formed the crane. A careful examination into the condition of the masonry was then made, when it was found that much had utterly decayed, and would have to be taken down before continuing the new work; for, in the upper parts of the towers, at least, much of the local soft sandstone appears to have been used, and this was in parts so weathered away, that in one instance the root of a creeper was followed down to a depth of 20 ft. before it could be extracted. As the annual tourist this year approaches what Mr. Spurgeon calls (like Coleridge before him) the City of a Thousand Smells, and the fine old tower gradually looms into view, he will find that his old friend has disappeared, and the puff of white steam will tell him that here as everywhere the steam-engine has superseded manual lifting-power. A stationary engine of 8-horse power will be at work, lifting in four minutes what in days gone by would have taken two days. Both towers are in hand at the same time, the progress of both being the same; and being connected by means of a light iron bridge fitted with rails, the stones can be moved, when up, to any required spot. The pecuniary means whereby these works are carried on are twofold,—namely, first, by voluntary aid (his Majesty the King of Prussia heading the list with a handsome annual contribution), and, secondly, by the questionable proceeds of a lottery, which produces to the Dom Committee an annual income of about 37,000*l.* It is thus hoped that the second story of both towers will be completed in two years and a half, the octagonal part in two years and a half more, and the whole work by the year 1877. After perusing the above paragraph, the reader will be amused to learn that Bishop Barthelet, of Aix-la-Chapelle, in a report on the cathedral at

the beginning of the present century, actually advised Napoleon I. to have the whole structure razed to the ground, as it was "positively unsafe to walk under it!"

MICHAEL FARADAY.

THE last number issued of the "Proceedings of the Royal Society" (No. 106, vol. xvii.) contains amongst the Obituary Notices of Deceased Fellows an interesting and important narrative of the chief events of his personal history, "with such indications of his character and opinions as may be read in his written correspondence and private memorials." It has been put together by Dr. Bence Jones, F.R.S., occupies 68 pages, and is full of delightful teaching. The way in which Faraday acknowledged, on many occasions his obligations to Mrs. Marcet's well-known "Conversations" will interest on several grounds. He thus wrote to M. De la Rive on the occasion of that lady's death:—

"Your subject interested me deeply every way, for Mrs. Marcet was a good friend to me, as she must have been to many of the human race. I entered the shop of a bookseller and bookbinder, at the age of thirteen, in the year 1804, remained there eight years, and during the chief part of the time bound books. Now it was in those books, in the hours after work, that I found the beginning of my philosophy. There were two that especially helped me, the 'Encyclopædia Britannica,' from which I gained my first notions of electricity, and Mrs. Marcet's 'Conversations on Chemistry,' which gave me my foundation in that science.

Do not suppose that I was a very deep thinker, or was marked as a precocious person. I was a very lively, imaginative person, and could believe in the 'Arabian Nights' as easily as in the 'Encyclopædia;' but facts were important to me and saved me. I could trust a fact, and always cross-examined an assertion. So when I questioned Mrs. Marcet's book by such little experiments as I could find means to perform, and found it true to the facts as I could understand them, I felt that I had got hold of an anchor in chemical knowledge, and clung fast to it. Thence my deep veneration for Mrs. Marcet; first, as one who had conferred great personal good and pleasure on me, and then as one able to convey the truth and principle of those boundless fields of knowledge which concern natural things to the young, untaught, and inquiring mind.

You may imagine my delight when I came to know Mrs. Marcet personally; how often I cast my thoughts backwards, delighting to connect the past and the present; how often, when sending a paper to her as a thank-offering, I thought of my first instructress; and such-like thoughts will remain with me."

A life of continuous unselfish work was that of this "blacksmith's son from Jacob's-Well-mews, full of inborn religion, and gentleness, genius, and energy, [who] searched for truth and trusted to facts in his experimental researches, and thus left to science a monument of himself that may be compared even to that of Newton."

A VOICE FROM THE CRYPT OF ST. PAUL'S.

SIR,—Will you allow me to appeal to you, as one of the recognised guardians of our public buildings, to prevent the desecration and the great injury which the annual assembly of the charity children within St. Paul's Cathedral does to the sacred edifice itself, and to the various national monuments it contains? This assembly of the children has hitherto taken place in June, so that if the subject were brought forward now, there would be ample time to investigate the matter and to make other arrangements.

For some time before the day of meeting, load upon load of heavy timber is carried into the cathedral, and a host of workmen sent in to erect the staging necessary for the accommodation of many hundreds of children and of spectators. To say nothing of the interruption to the ordinary service of the cathedral, and violation of the tranquillity which should reign in this national mausoleum, just think of the danger and the actual damage done to the monuments of those whom the nation delights to honour, and which have cost, individually and collectively, vast sums of public money. The sculptured effigies of our great countrymen are out of reach of ordinary visitors, which clearly shows that the injuries they have sustained must have been caused by careless workmen, and be the result of these heavy timber erections. And after these huge balks of timber and immense loads of planking have been crowded in, so as to occupy the whole area of the noble dome, what then? All this expense, labour, risk of fire, fuss, and trouble, are incurred for the mighty grand purpose of allowing some hundreds of educated people to listen to the performance of an enormous number of ill-instructed charity children, singing psalms and hymns in a way to illustrate the lamentable deficiency of musical tuition in this country. And then come several more days of hammering and wrenching apart; the staging is taken down, and the loads of planking and timber are bundled *out* of the cathedral.

Now, I ask you, Mr. Editor, *cui bono?* If it be desirable the charity children should have an annual gathering, why not let it be held in Exeter Hall, or the Crystal Palace? Both of these places are already prepared for such exhibitions; but the latter especially recommends itself as a means of sparing the poor children much suffering and inconvenience; and after the performance is concluded, they could enjoy some recreation and amusement.

With the meeting at St. Paul's as now arranged, the access to the children's seats being very limited and exceedingly inconvenient, the poor little creatures are obliged to be in their places some hours before the time of performance, and there they must sit, hungry and weary, for many of them have walked long distances to the cathedral; and when, as is frequently the case, a girl faints from the heat and from sheer exhaustion, she has to be lifted out over the heads of her companions.

A third point is, what becomes of the money collected at this festival? On the day of rehearsal it may be small in amount, but on the "grand day" it must be considerable. The whole affair is in the hands of "The Society of Patrons," who are supposed to help the parochial schools from the funds so collected. Who has ever seen an account of the receipts and disbursements? The writer, some twenty years ago, filled a public office, and was then told it was right for him to go to this celebration. At the cathedral and at the dinner afterwards, to which he was invited, he gave about 25*l*. The following year he was invited to the sumptuous dinner at the London Tavern, the few gentlemen constituting the "Society of Patrons," being in all their glory. Since then he has heard nothing of them or their doings, nor of their society, saving the notice in the public newspapers of the meeting of the charity children in St. Paul's.

Who constitute the Society of Patrons? Why are not the accounts sent to subscribers? Where are the said accounts to be seen? Who are the auditors? And what good has the whole thing done?

A SHADE.

SANITARY MATTERS.

Kidderminster.—In compliance with a request by the local board of guardians, Dr. Roden, medical officer for the No. 2 district, Kidderminster, has presented a report embodying his views on the sanitary state of the town. Mr. Stretton, medical officer for No. 1 district, had already presented a report on the same subject. Dr. Roden remarks at the outset, that he quite agrees with Mr. Stretton that, although the town would never be placed in a secure state till proper drainage and water works were carried out, there were, nevertheless, many local causes of disease not connected with such works which required prompt removal or amelioration. He could safely say that scarcely a death from fever or other zymotic disease had occurred in his medical district, that he could not almost immediately trace to some cause capable of amendment or entire removal. Pigstyes were scattered in all directions at the rear of rows of houses, and in crowded streets and alleys, throughout the densely-populated parts of the town, and generally so near the houses as to be a constant source of disease. Privies and open ashpits were generally still nearer to the houses, and so constructed that the roof shuts the rain-water into the ashpit, thus giving rise to pestilential vapours, and dealing out death and disease to the entire neighbourhood. Doubtless, [he said] the proper remedy for this state of matters would be the adoption of earth closets; but, as he imagined it would be next to impossible to carry out such a system in large towns, some plan of amelioration should be attempted. Besides scarlet fever, which has latterly been the cause of the increased mortality, the population had been visited by almost every form of exanthematous and zymotic disease, including measles, erysipelas, gastric and typhus fevers, whooping cough, croup, diphtheria, diarrhœa, &c., and under such conditions it was easy to understand that bronchitis, consumption, rheumatism, and other blood diseases were not only engendered, but their victims were, in many cases, rapidly hurled to a premature grave; while, as regarded scarlet fever, the disease has assumed the most malignant type—it was, in fact, nothing less than the putrid sore throat of bygone times. Dr. Roden suggested various remedies which should be adopted without further unnecessary delay. First and foremost, he would advise the early adoption of the Public Health and Local Government Acts. The application of these Acts he thought ought to be compulsory on towns of a population of 10,000 and upwards, as should the appointment of medical officer of health in all cases where the Act is applied. A complete system of sewerage and waterworks could no longer be delayed, or the town might lose the opportunity of controlling the expenditure. The council should adopt Mr. Torrens's Bill for providing better dwellings for artisans and labourers, which, he remarked, would be of incalculable benefit to the town.

Sheerness.—The town of Sheerness, once reputed to be a most unhealthy place, appears now to be one of the healthiest towns in England. The number of deaths registered in the year 1868 for the sub-district of Minster, in Sheppy, including Sheerness and Queenborough, was 304. The population of this sub-district was 17,000 in 1861, and is now at least 20,000. Hence the death-rate of Sheerness is only fifteen in the thousand—seven less than the death-rate of England and Wales, ten less than that of London, and lower than that of any watering-place in England except Eastbourne. This surprising improvement in the health of Sheerness is not exceptional, the death-rate of 1867 being nearly as low. The great improvements effected during the last ten years in the sanitary regulations of the town, with the natural salubrity of the fresh sea-air to which Sheerness is exposed, have tended to produce this favourable result. The want of additional and better class houses is much felt, and extensive building operations are contemplated during the coming summer. A large public hall, with reading-rooms, &c., is in course of erection. The Government has been induced to dispose of a quantity of land for building purposes to meet the local want of houses.

THE TEMPLE OF HEROD.

LIEUT. WARREN has recently addressed some speculations on this subject to the Palestine Exploration Committee. He says:—"From our present knowledge of the Haram area, we may draw the inference that the southern wall is that spoken of by Josephus as the south wall of Herod's enclosure; for we have the Ophel wall joining in at the south-east angle, at what would have been the eastern cloisters, and we have the arches of Robinson and Wilson on the west; and the great difficulty now is the dilemma about the dimensions given by Josephus; for, while on the one hand, he leads us to suppose that the Temple enclosure of King Solomon was in compass four furlongs, and that the area was doubled by Herod, yet, on the other hand, he gives us six furlongs as the compass of Herod's enclosure, including Antonia: so that it is an open question as to what the exact measurements were.

We have, however, in the present walls, certain conditions given to us in Josephus's account of Herod's Temple, and it may be interesting to apply to these Haram walls a plan of that ancient enclosure. For this purpose I have taken the plan of the Temple, constructed by the Rev. John Lightfoot, D.D., in 1684, because it was made (by his own account) entirely from the ancient writings, his mind being unbiassed by any knowledge of the present Haram enclosure. I have taken his southern wall, and applied it to the south wall of the Haram area, lengthening it until they coincide, and at the same time increasing all the parts to scale. We have then a plan of Herod's enclosure occupying the southern part of the Haram area, and being a square of about 900 ft. a side, its compass being six furlongs."

The writer then goes on to note the results, pointing out relations and discrepancies, and showing that there are between Dr. Lightfoot's plan and the present Haram area a number of points of resemblance, which are sufficient to draw serious attention to the matter; but out of them there are two or three points which tell almost equally in favour of those plans in which the altar is placed near to the *sakhra*.

His remarks may be useful to those who are interested in locating the Temple inclosure; but we seem to be a long way yet from fixing the position with any degree of certainty.

HOUSE BUILDING.

IN the course of the discussion at the Institute of Architects last week, on the description given of Humewood,* in the county of Wicklow, Ireland, Mr. T. R. Smith said it was natural that some differences of opinion should arise on the subject of building. One was as to the treatment of granite. There appeared to him to be great advantage to the architect in the use of granite, inasmuch as it was a material of that refractory character which would not allow him to be run away with by all sorts of fancies; and much of the effect of the recent works in Dublin, he thought, was mainly due to their having been executed in a material which would only bear a treatment of great breadth and simplicity. Any description of fine moulding in granite was out of place, unless it was polished, and then they got into great expense. He would be glad to hear the criticism of the meeting with regard to the arrangement, as in the instance before them, of placing the kitchens and other servants' offices in the basement, beneath the principal floor of the house. They had been led to believe that in country residences, where there was more space at command than in towns, there was advantage in having the offices on the same level as the house, and that the drawback of a long corridor was compensated by the freedom from noise and odours arising from the basement. At the same time, in the present case, no doubt there was great economy in the arrangement of the servants' offices beneath the principal floors.

Professor Kerr said the question of placing the domestic offices in the basement, or on the same level as the house, was one very much to be decided by the tastes and habits of the family occupying it. In the case before them it was obvious that the garden front of the mansion was overlooked from the servants' offices. This would be an objection with some people; but such an arrangement of the offices as had been carried out at Humewood was, no doubt, highly economical. With regard to general convenience much, no doubt, was to be said on both sides. To some people the carrying of dinners up a staircase was objectionable, and principally affected the servants themselves. The question of the casements of the windows instead of sashes was one on which they might reflect a little. He thought they might take it that in this climate the sash window was the only known contrivance which would keep out the weather. No casement he had ever heard of was effective against a thorough wet wind in England; and it must be still less effective in Ireland. In his own practice he ventured to introduce sash windows in every case, even in mullioned windows, and the suggestion which occurred to one's mind that the sash had an unpleasant external appearance was not borne out in fact if they got a sufficiently deep réveal. He would like to receive a little more explanation with regard to the gutters. The construction of the tile and slate flat described was, he thought, rather a novel thing, but he did not think others would be persuaded to adopt it in preference to a lead flat. The gutters were, perhaps, as remarkable in their way as the flats, and he would like to ask Mr. White how the down-pipe acted which was inside the wall. He (Professor Kerr) said he believed most people made it an invariable rule to have the down-pipe outside the wall; and in his younger days he received a lesson with regard to inside down-pipes which led him to avoid them thereafter. His apprehension in the present case was, that when the pipes stood full of water, the water would find its way through some unexpected place in the wall.

Mr. C. F. Hayward thought the question of basement offices and the arrangement of the same accommodation on the ground-level could only be practically answered by saying it was entirely a matter of taste on the part of the proprietor interested in the subject of the roof flat, because he had a belief in the tile flat in opposition to the lead flat, and he saw no reason why it should not answer in the present case. There were certain disadvantages in lead flats—one of which was the frequency with which they required to be repaired, and the little purloinings which went on during those repairs, and the frequent shovelling off of snow was liable to damage the lead. In this respect he felt Mr. White had done good service in having entered upon this particular experiment, and it was one which was deserving of consideration; and on this point he would be glad to have some information as to the comparative cost of the two modes of construction. He thought there were very good grounds for adopting such a plan as this in opposition to the lead flat, and he hoped the experiment in this instance would be successful. The question of casement *versus* sash was one of importance, insomuch as upon the determination of it depended the arrangement of the curtain and other decorations of the room.

Mr. Brooks suggested that the objection to basement offices on the score of their overlooking the garden front could be obviated by the use of roughed plate glass in the windows.

Mr. White, in concluding the discussion, said, with regard to the arrangement of the domestic offices in the basement, beneath the principal living-rooms, he should be better able to give an opinion in two or three years time, and he should then be happy to communicate to them what the experience in this particular residence was. But the question here was that, inasmuch as there must of necessity be a basement of 8 ft. or 10 ft.,—in the first place, for the sake of getting out of the cold and damp, and secondly, for the sake of the prospect, it would have been an enormous waste of space if it had not been utilised for the servants' offices. As arranged in this instance, he thought there was the minimum of inconvenience from the adoption of that plan. He conceived that all these offices being brought into such very available communication with the living part of the house was a great advantage. In a residence on a smaller scale he might hesitate to place the kitchens, &c., on the basement. With regard to the overlooking of the garden front from the offices, it was to be remarked that it was at a point of the ground which would never be much used by the family or visitors, as it was the way to the stables and other parts of the out-premises, and the windows were glazed to the height of six feet with roughed glass. With regard to dinner-lifts he believed they were only lifts to smells all over the house, from what he had heard of places in which they had been adopted. With regard to the question of sashes and casements, he could say he had seen as much wet come through the former as the latter, and he had seen casements which were impervious to rain and wind in the most exposed situations; and he had also seen sashes which did let in a vast quantity of both. Casements, on the other hand, he regarded as best adapted for the display of fine scenery and prospect. With regard to down-pipes within the walls, he thought Professor Kerr, in the case he referred to, must have used pipes which were insufficient for the overflows. The pipes at Humewood, he said, were 6 in. diameter, and were placed between the outer and inner casing of brick-work which lined the house. With regard to the true curves of mouldings, of course it was impossible to explain or define why one curve was better than another, and why one point which was simply artistic should have a more pleasant effect than another. All they could aim at was the result to be derived from them as a whole.

* See p. 26, *ante*. View, plan, and description of this mansion will be found in our Vol. XXVI., pp. 587, 588, 589.

NEW CONGREGATIONAL CHURCHES.

"THE Congregational Year Book for 1869"* shows, as our own pages have already done, great activity on the part of the body it represents, in building churches, chapels, and schools. It shows that there have been fourteen new churches formed in England, three in Wales, and two in Queensland. The foundations have been laid of thirty chapels in England, of four in Wales, one in Canada, and one in Madagascar. Fifty new chapels have been opened in England, eleven in Wales, three in Scotland, seven in the colonies, and one in Paris. The foundations of four schools have been laid, and twenty new schools have been opened. The Year Book contains descriptions and views of a number of the buildings erected, and of these we give two:—

Trinity Congregational Church, Huntingdon.

This church is a large structure of the early decorated style of Gothic architecture, with tower and spire at the south-west angle of the front; the total height of the latter being 190 ft.

The church stands 45 ft. back from the High-street, the open space being inclosed. The plan of the church is cruciform, having a total length of 114 ft., 49 ft. wide across the nave and aisles, and 60 ft. across transept. The height of the church, from floor to ceiling, is 48 ft.; and the average height of the aisles is 24 ft.

The arches, separating the aisles and transepts from the nave, are of moulded Bath stone, and support a clearstory, having double-light windows, with traceried heads. The columns are of cast-iron, bronzed. The ceiling of the nave is continued the full height, over the apse, and terminates in an octagonal form. The trusses of the roof rest on dwarf stone columns, having sculptured caps and corbels; the wall space, beneath the windows of the apse, is covered with arcading, surmounted by a corbel table—the whole forming a reredos. The panels are fitted with Irish marble, having Scripture texts. This decoration has been erected to the memory of the Rev. W. Wright, the first pastor of the church, by his son, Mr. Samuel Wright.

The floor of the apse is raised about 18 in. above that of the church, and choir-seats are placed on each side. The organ-chamber is on the left of the apse, and opens into it and the aisles by stone arches and columns. On the right side of the apse is a corresponding arch fitted with a wood screen. The tower entrance has a stone-vaulted ceiling, with moulded ribs and sculptured corbels. Beneath the church is a large school-room, 60 ft. by 31 ft.; infant school-room, and seven good class-rooms, besides a library, warming-chamber, large lavatory, and other conveniences. The height of the basement is 12 ft. The warming apparatus consists of hot-water pipes, which run up the centre, and round the sides of the church. The church is at present arranged for about 720 sittings on the ground-floor. Mr. John Tarring is the architect.

Congregational Church, Ancoats, Manchester.

Amongst the illustrations in the Year Book of 1866, was one of a new church at Pin Mill Brow, in Ancoats, Manchester. Very shortly after that building was opened, the Midland Railway Company obtained powers for a line to a new goods depôt, which necessitated its purchase. It still stands, but has not been used for worship since then. With the proceeds of the sale of the property, the trustees purchased the only available plot of land in the township, viz., the site of the old gas-works. The accompanying engraving shows the structure, as now in progress. The river is about 25 ft. below the road; and, after allowing for floods, the depth at that end admits of a large room below the church floor, 47 ft. by 30 ft., and 15 ft. high. This will be temporarily divided, and used for infant and elementary class-rooms. The interior of the building is 88 ft. long, by a mean clear width of 50 ft. Galleries are provided on three sides, and two spacious staircases thereto. Underneath the galleries will be class-rooms, ten in number; temporarily separated from the central portion of the body of the church by lath-and-plaster partitions.

It is intended to fit up the galleries with pews, for appropriate sittings for the congregation, and to use the ground floor for school purposes at present. The entrances are so arranged that access to the galleries is exclusively confined to the congregation.

The body of the ground floor will contain movable forms, capable of seating 300 adults, which, added to the sittings in the galleries, will give accommodation for a congregation of 650 persons.

The roof is supported by wood pillars, in a line with the side-gallery fronts, connected by framed spandrels above. All the timbers will be exposed to view, and stained and varnished. The walls are of brick, with stone dressings. The roofing will be covered with Knelhelli slates.

Provision is made in a cellar-basement for Haden's heating-apparatus. The cost of the building proper is 4,710*l.*, which is the amount of the builder's contract. This includes 500*l.*, at least, for extra foundations, the whole of the walls having to be taken down to the level of the bed of the river, between 20 ft. and 30 ft. below the ground surface. The lighting, heating, and movable furniture, boundary fences, and architects' commission, will swell the total outlay to about 5,800*l.* The architects are Messrs. Paull & Robinson, Manchester.

* The Congregational Year Book, 1869. Containing the proceedings of the Congregational Union for 1868, and general statistics of the denomination. London: Hodder & Stoughton.

Society of Engineers.—At the meeting of this society, to be held on the 18th inst., the president will present the premiums awarded for papers read during the year 1868, and the president for 1869 will deliver his inaugural address.

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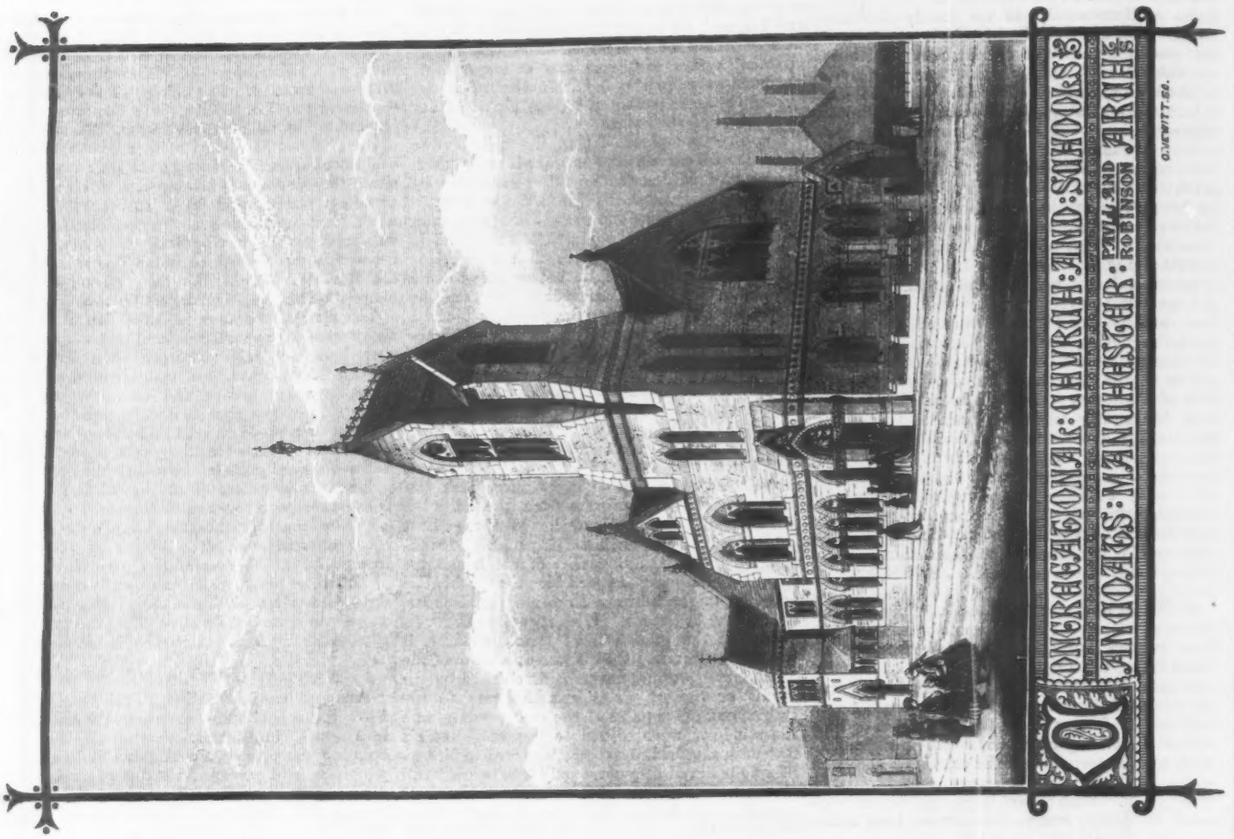
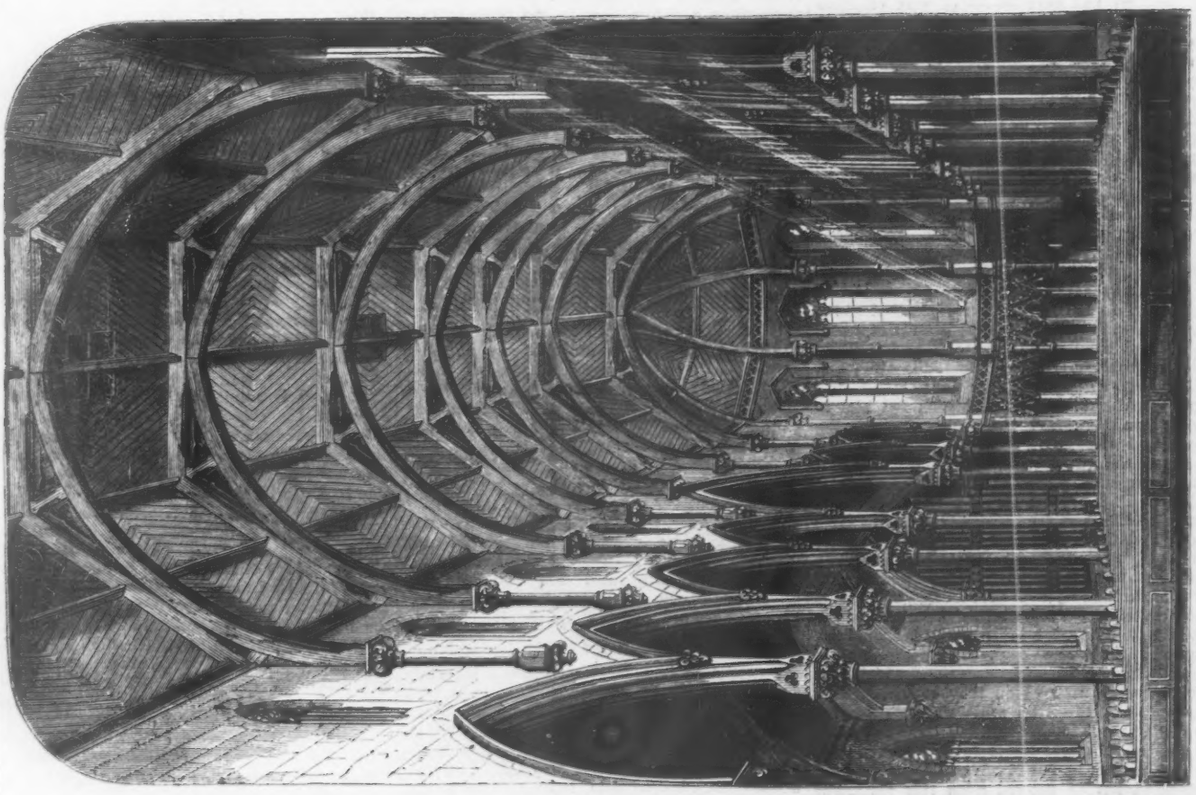
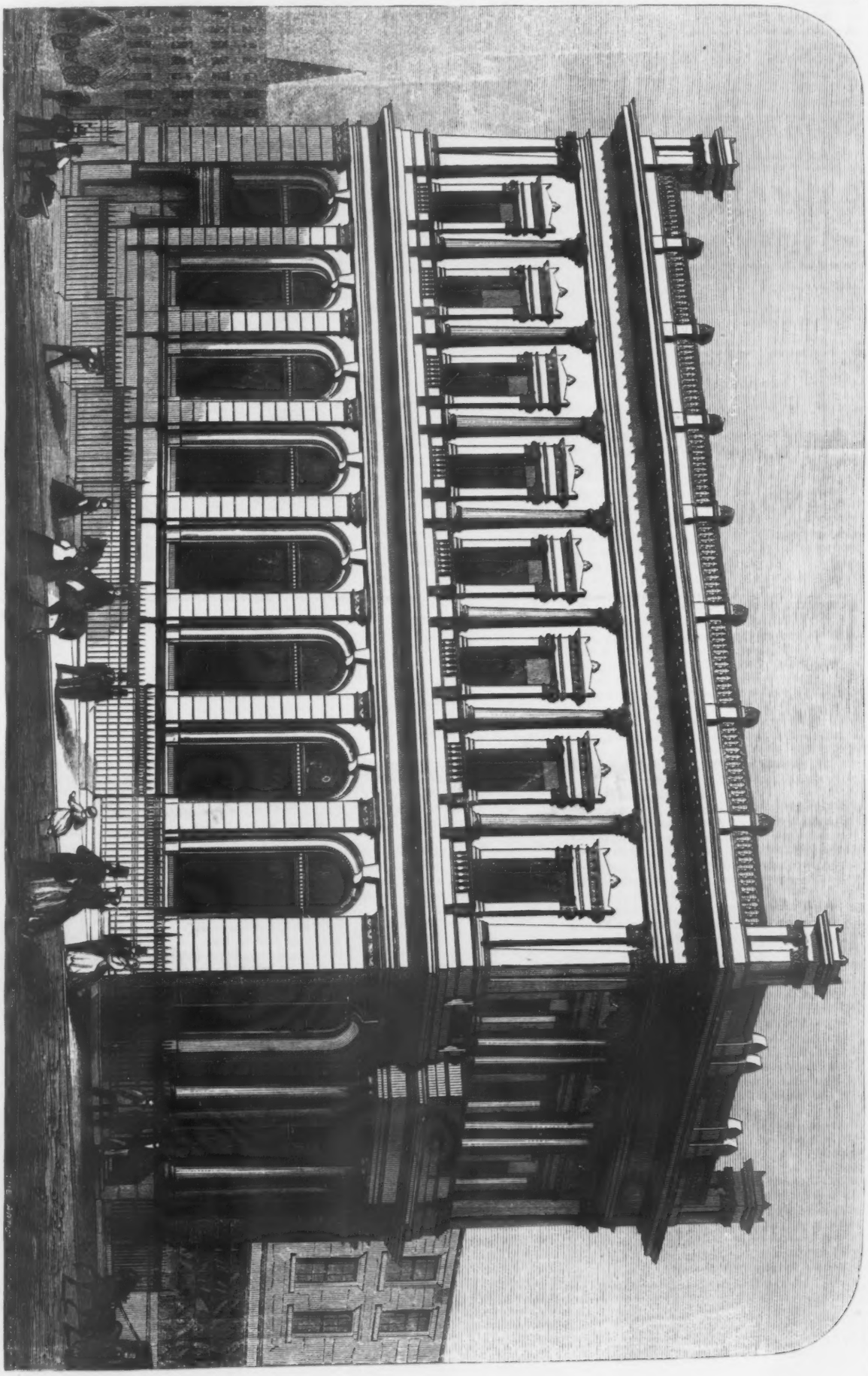




INTERIOR OF TRINITY CONGREGATIONAL CHURCH, HUNTINGDON.
MR. JOHN TARRING, ARCHITECT.



THE BIRMINGHAM AND MIDLAND BANK, NEW STREET, BIRMINGHAM.—MR. EDWARD HOLMES, ARCHITECT.

[See page 40.

ARTERIAL AND AGRICULTURAL DISTRICT DRAINAGE, AND THE LAWS CONNECTED THEREWITH.*

THE term "arterial" has been applied to the rivers and streams of a country in consequence of their similarity to the arteries for conveying the blood through the body, and the appearances of a map and of a drawing of the arteries of the body are precisely the same.

In this paper it is proposed to advocate the principles of arterial drainage by pointing out the great benefits that would ensue from a more extensive adoption of the system, and by giving an account of the results in those cases where some combined systems or district drainages have been carried out.

Before an institution consisting, as this does, of persons practically acquainted with the management of land, and who are fully alive to the improvement of which it is often capable, by the application of engineering works, it would seem unnecessary to occupy time in discussing questions so familiar to them. Nevertheless, as an inspector under "The Land Drainage Act, 1861," having had a better opportunity of forming an acquaintance with the subject, perhaps, than most persons, I have found that the advantages of such works, particularly in some parts of England, are not appreciated as they ought to be, and I hope that the influence and intelligent spirit of the members will be exerted to recommend the adoption of the facilities offered by this Act. As an illustration of the works that have been carried out in training and forming the courses of rivers through marsh lands, we need only refer to the fens in the counties of Lincoln, Cambridge, and Norfolk, to understand what can be done by combined systems of drainage in reclaiming land, and in preparing it for cultivation.

The necessity for district systems of arterial drainage has, it is well known, arisen from the great increase of pipe drainage, and the better clearing and opening of ditches and drains of late years, thereby causing a more rapid and an increasing discharge of water from the uplands into the valleys, and overloading the rivers and streams, so flooding them more frequently, and to a larger extent, than was experienced in former times; besides which, those valley lands being subject to floods, or the water constantly lying within a few inches of the surface, have their crops frequently destroyed, and are available as pastures for a much shorter period in each year than they really ought to be.

The difficulties that formerly arose, from the state of the law, in constituting any combined action to remove obstructions in rivers, to deepen, straighten, and improve them, and to form proper outfalls through the lands of hostile owners, or of those who were indifferent to the improvement of their own land, or unwilling to give facilities to others, have been, to some extent, removed by an alteration and extension of the powers of the old sewers laws.

I read a paper on "Arterial Drainage and Outfalls," at the Institution of Civil Engineers, in 1859-60, after which Sir George Cornewall Lewis, then at the Home Office, prepared a Bill extending the powers of the laws relating to the Commissions of Sewers. In 1861, the Act called "The Land Drainage Act" was passed. The main features of that Act are that it enables commissions of sewers or district drainage Boards, as the promoters may elect, to be formed in river valleys, or in marsh and low lands, by those who may be interested in them, by combining under either of the above forms to carry out works in making new watercourses and improving rivers, with the necessary outfalls, and to tax the lands benefited by these means within a properly defined jurisdiction, sanctioned by the Inclosure Commissioners, but extending into valleys in the interior, and not limited to the area marked out by the level of the tides, as the old commissions are. The Act also provides for the reclamation of land from the sea, irrigation, &c.

Mr. Theodore Thring has published a manual of the Act, which I beg to recommend to any one who wishes to be informed of its various powers.

The number of cases under the Act, amount to twenty-two, of which I have inspected twenty-one, and these districts comprise, in all, about 70,600 acres.

* From a paper by Mr. R. Boxall Grantham, C.E., read at the Ordinary General Meeting of the Institution of Surveyors, January 11th, 1869. The President in the chair.

The following is a list of the districts which have been formed:—

	Acres.
Morden Carrs, Durham	4,000
Wormbrook, Hereford	1,977½
Wissey, Norfolk	8,240½
Ladden Brook, Gloucester	957
Longdon and Eldersfield, Worcester	3,595
Llangorse, Brecon	1,085½
Maxey, Northampton	7,918
Martham, Norfolk	591½
River Idle, Nottingham	6,000
Stanmoor, Somerset	676½
Currymoor, Somerset	1,820
Dysynny, Merioneth	2,564
Staunton Common, Hereford	1,454
Winterton, Norfolk	1,055
Chedzoy, Somerset	3,412½
King's Sedgmoor, Somerset	11,259
Frodsham, Cheshire	4,217
Northmoor, Oxford	2,364
North Moor, Somerset	3,235
Aller Moor, Somerset	2,155½
Haddiscoe, Norfolk	1,628
Muckfleet, Norfolk	1,404

Some of these have been carried out most successfully, and others are in progress, and some have not been commenced. The areas of each district vary, as will be seen, from 591 to 11,259 acres.

The cost of putting the powers of the Act into operation has been on an average 50*l.* in each case.

I do not know that I can illustrate the subject better than by describing the practical results of different methods of carrying out a combined system of arterial drainage. For this purpose I have selected a district drained by gravitation; another by means of pumping; and a private drainage, also by pumping.

The first is that of the Leadon, which is a river rising in Herefordshire and Worcestershire, with a watershed of about 120 square miles. The district was formed under a Commission of Sewers in 1861, and the works, which are confined to the jurisdiction, were completed, as far as they could be then executed, in 1867. The commissioners, in order to inform those who are interested in the improvement, lately published a statement of their proceedings, with an account of the expenditure. The account shows the total expenditure; but it should be remarked that the purchase of the water rights and compensations absorbed more than half of it.

The Leadon flows into the western branch of the river Severn, about 1½ mile from Gloucester. There were formerly two mills upon it—one, the Over Mill at the Severn; and the other, Rudford Mill, about 2½ miles above it—by which the water was penned back for upwards of 5 miles. The water-power of both mills was purchased by the commissioners, who were thus enabled to deepen, widen, and straighten the river where requisite; and the effect has been to lower the water towards the outfall 5 ft., and at the upper end 4 ft. The jurisdiction of the commissioners, which includes a branch river in the parish of Tibberton, extends over about 1,400 acres.

From the Severn to the archway under the Hereford and Gloucester Canal, which is 4⅝ miles, the work consisted for the greater part of a new cut, and the remainder in deepening and taking off bends only. Both sides of the new river, for a mile and a half in length up from the Severn, as well as along the bank parallel to the Severn, were embanked, to keep out the tides and its flood-waters, and also to confine the floods of the Leadon itself, which flow down from the upper country about two days before those of the Severn arrive at the same point. From the Hereford and Gloucester Canal through Tibberton parish, being about 1½ mile, the brook was deepened and widened in places, and in others the banks were dressed off and the bushes cleared. From about the fourth mile on the main river it was deepened, cleared of bushes and weeds, and the banks dressed off for about 2 miles, making altogether nearly 7 miles,—the cost of which amounted to about 3,070*l.*, including superintendence. The remainder of the outlay was for obtaining the commission, raising money, office and legal expenses, &c. The money has been borrowed, and will be paid off in twenty-five years. The rate for the repayment of this and interest, together with the annual expense of clerk, varies from 9s. to 11s. per acre, assessed upon the land according to the benefit conferred. For the first two years after completion of the main cuts for the river, the repairs and clearing the bottom and sides cost only 10*l.* The practical result has been that the floods caused by the river Leadon itself have not overflowed its new channel, and the floods and tides of the Severn itself have been so confined within its own banks as to prevent them overflowing the adjoining land, and their duration is very much reduced. The floods have never since injured the growing grass, nor carried it away when cut, as was formerly the case in about one year out of four. The quality of the grass is very much improved, and cattle and sheep can remain on the pastures nearly all the year. The under-drainage can be better carried out, and the river is as nearly as possible under the control of those who are interested in its proper action. To conclude the description of this work, I cannot do better than quote a letter written to me by Mr. William P. Price, the member for Gloucester, and chairman of the Leadon Commission, who lives in the neighbourhood, and has a large area of land within the jurisdiction:—

"November 29th, 1868.

The result of our Leadon drainage may be stated in a very few words.

We can now drain effectually all the lower level, which we could not have done before; and the floods are much fewer in number, and when they come do not hurt us, because they are off again directly.

The drainage has done all I ever expected of it.

It is difficult to speak of the commercial value. The rates may be taken to be about 7s. 6d. per acre, putting the rest for redemption of capital outlay. Is the improvement worth this 7s. 6d. to the tenant?

In the first place, I don't think any one of them denies it. But if they did, I should not believe them.

In the second place, one hay crop saved in every four years would pay it for them: and summer floods destroyed the crops at least once in four years.

But, apart from this, we can now keep cattle in the land *always*, except during the very short duration of a flood, which we rarely experience now, except when the cattle are all in the folds. W. P. PRICE.

Note.—The average cost per acre which Mr. Price refers to is that which is chargeable to the tenant, being the interest, the landlord generally paying the difference, which is the redemption of capital outlay."

The next case which I propose to describe is that of a district in Norfolk, in the parishes of Winterton and Somerton, about 10 miles north of Yarmouth, and which is drained by pumping. This district, containing about 1,100 acres, is comprised within a watershed of about 2,500 acres, and lies in a basin, formed by high land on the south side, and bounded on the west and north sides by Martham Broad, or Lake, and the Hundred Stream, the levels of which are from 3 ft. to 4 ft. above the area: on the east side are sand hills on the sea shore.

The soil at the eastern side consists of sand, yielding much water from the sand hills; it then, as we proceed westward, becomes peat of some depth in places below the bottoms of the drains; farther west still, the clay locally called ooze, or boulder clay, underlies the peat, and appears on the surface; and then, at the extreme west, there is peat again to a small extent.

The land, previous to the formation of the Commission, was drained by a windmill, driving a scoop wheel, which was destroyed in a gale of wind; and also by a small steam engine, driving another scoop wheel, which was too small by itself to drain the lands.

The area was, in fact, a marsh; for, although the wheels lifted the water out, floods occurred, and the drains were seldom free from water, the level of which was within about 2 ft. of the surface of the land, which produced little more than rushes and water weeds, and cattle could remain on the lands a few months only, even if the weather was fine. The marsh lands are generally let with the uplands in proportion to their extent, and, therefore, no definite rental is charged upon them exclusively; but I have always considered that an average of 10s. per acre was as much as they were worth. In 1864, a commission of sewers, under the "Land Drainage Act," was issued, called the "Winterton and Somerton Commission of Sewers."

The object of the work was to collect the water by a main leading drain at one point, from which it could be pumped into the Martham Broad, or lake, a lift of 5 ft. to 7 ft.; and, in 1865, an Appold pump, worked by steam, was erected for this purpose.

It should be mentioned that the natural fall of the country was towards the sea, and that the hundred stream formerly discharged itself into the sea, through what are now high hills of sand, so that the drainage of the eastern portion has been diverted westerly against its natural direction; and it was therefore necessary to cut the drains through a summit in the district to make the water flow to the pump, which caused deeper cutting for the drains than would otherwise have been required. The different parts of the work were done by contract, completed in July, 1866, and the following is a summary of the cost:—

Earthworks	£1,422
Pump and engines	1,304
Bridges and culverts	512
Engine-house	526
Engineering and other costs	428
	£4,192

There are other items of expense, the amounts of which I am not acquainted with, but I consider that the whole cost has not much exceeded 4,500*l.*, or about 4*l.* per acre. At first, owing to the land having been for all time full of water, and several springs existing, which came from the northern high land and sand hills, frequent pumping was necessary to keep the water in the drains low; but the subsidence of the peat lands, and the draining kept up by the pump, have very considerably reduced the necessity for its use. The rate, including the repayment of the borrowed money, is about 8*s.* per acre. In this case the rate is levied equally on the acreage, and not in proportion to the benefit conferred.

A great part of the area has been ploughed up, and the remainder has become firm pasture, which, in the course of time, will be improved by the disappearance of rushes, flags, and water-weeds. The nearest value that I can arrive at is, that the parts which have been wholly reclaimed are worth, to rent, 30*s.* per acre, and the remainder, 2*l.* per acre at the present time; and this value will doubtless increase. . . . .

The "Land Drainage Act, 1861," has hitherto not been applied so extensively as might have been expected, considering the great scope of its powers, and the advantages which result from them if properly called into action. It is, doubtless, well known to you that the old sewers laws could not be made available for the improving and advancing the interests of agriculture in the present times. They certainly impose but light burthens upon lands by way of rates; but the powers are so restricted, the jurisdictions are so undefined, and the governing bodies so varying and irresponsible, and, generally, unconcerned, that they are almost useless for the exercise of extended operations.

But the "Land Drainage Act, 1861," requires amendment in some particulars, with the addition of provisions to make it more applicable to the purposes of agriculture, and that only. The old sewers laws are applicable, as far as they go, both to the drainage of towns and of agricultural districts; for it was not contemplated when they were framed that any distinction between the two would have been necessary; but, of late years, towns and populous districts have well-defined laws of their own, applied under the sanction of a department of the Government, by which the mode of proceeding and method of rating are regulated, and other useful provisions are exercised; but the legislation for agricultural drainage purposes is surrounded by great difficulties and uncertainty; in fact, well-defined provisions are required for many purposes, and the chief of these is the mode of rating, in which there exists much doubt and difficulty. In my experience of this question of rating I have met with a great variety in the practice and opinions of the several valuers with whom I have come in contact; one has adopted the poor-rate as the basis of the rate; another, an equal acreage rate; and one or two, a rate according to the benefit conferred. Cases of appeal to Quarter Sessions have been referred to me; but I think there ought to be a special rule for this kind of rating. The only Act which in any way refers to this question is the 4 & 5 Vict., cap. 45 (which was merely an amendment Act of 3 & 4 Wm. IV., cap. 22), but in so indefinite a manner as to throw doubt upon it. The correct principle, in my opinion, is that it should be in proportion to the benefit conferred on the various lands by the works; and in Ireland, where the question of drainage and rating is unologged by sewers laws, the matter is better understood; and at the time of the famine, in 1847, when large arterial works were carried out, they adopted such a system, which is illustrated in the table below.

There is another important question, and that is the power and the means of taking land for new works, or removing mills and obstructions in rivers; but the regulations laid down in the law are most cumbersome and uncertain. There are many other matters, which it would be tedious to enumerate, each requiring amendment; and I am in hopes that in the next Session of Parliament, an inquiry will be instituted into all the laws relating to drainage, and that we shall have a well-defined and simple system of law established expressly for agricultural, arterial, and outfall drainage.

It would be very desirable to include, in any new Act, provisions for irrigation and storage of water, so that they might be either conjoined with or separated from drainage districts; and powers to charge either water rates or rents according to the systems adopted. The system of irrigation is extensively carried ont in France, in the districts of Alpes-Maritimes, Haute-Garonne, and Basses-Pyrénées; in Spain, in those of the Canal de Esla, Canal de Henares, and Canal de Logrono; and in Italy, at Milan, &c.

A discussion ensued, in which Messrs. Ryde, T. Marr Johnson, and others took part.

The next meeting will be held on Monday, the 25th inst., when the discussion on Mr. Grantham's paper will be resumed; and a paper will be read, entitled "Parochial Assessment," by Mr. Edward Ryde.

Name of Drainage District.	Area of Lands Drained or Improved.	Total Cost.	Original Annual Value of Lands Drained or Improved.	Increase in the original Annual Value of Lands Drained or Improved.	Cost of Works per Acre.	Annual Charge per Acre of Principal and Interest.
	A. R. P.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
District of the Blackwater in the Counties of Meath and Kildare	3,827 2 18	12,115 16 6	2,119 1 8	1,034 7 9	3 3 3	0 4 6
District of Lough Neagh, in the Counties of Antrim, Armagh, Down, Londonderry, & Tyrone	29,625 1 24	156,277 14 10	25,656 2 5	9,963 17 7	5 5 6	0 6 0
District of Oranhill, in the County of Galway	974 0 16	3,871 16 2	260 12 5	315 10 1	3 19 6	0 5 9

THE "BUILDER'S" LAW NOTES.

Execution of Public Works.—A certain local Act of Parliament authorises a local corporation when any street not being a highway is not sufficiently sewered, levelled, paved, flagged, and channelled, to give notice to the respective owners of the premises fronting such street, to sewer, level, pave, flag, or channel; and if the requirements of the notice were not complied with, the corporation might execute the works referred to in such notice, and recover the expenses from such owners. In a certain case the corporation gave notice to owners of premises in a street not a highway to "repair, form, and pave the same." It was held by the Court of Queen's Bench, on appeal, that the notice was bad as it did not sufficiently specify the works required to be done, and the order of justices for the payment of expenses was accordingly quashed.—*Parkinson* v. *The Corporation of Blackburn.*

Rateable Value of a Railway Goods Station.—A certain borough Improvement Act authorising a rate to be levied enacted that the occupiers of any land used only as a canal or a towing-path for the same, or as a railway constructed under the powers of any Act of Parliament, should be rated at one-fourth only of the net annual value. Certain sidings and turntables, occupying about ten acres of land, were used for loading trucks or carriages with goods, and also as a standing-place for laden and unladen carriages, and were found in a special case to be necessary for conducting the traffic of the railway. It was decided that this land might be virtually considered as part of the railway, and it was accordingly only rated at one-fourth of the net annual value.—*Midland Railway Company* v. *The Corporation of Birmingham.*

Consumption of Smoke.—Under the provisions of the Towns Improvement Clauses Act, a penalty was imposed on persons so negligently using a furnace as not to consume the smoke arising from it. The Birmingham Improvement Act incorporated this provision, but with the reservation that the words, "consume the smoke," should not in all cases mean "consume all the smoke;" and that the penalty might be remitted if the person summoned had so constructed or altered his furnace as to consume, as far as possible, its smoke, and had carefully attended to the same, and had, in fact, consumed the smoke as far as possible. An information was laid against a manufacturer for so negligently using his furnace as not to consume its smoke. It was not shown that the furnace was improperly constructed; it was found, on the contrary, that it was capable of consuming more smoke than in fact it did; but it was urged in defence that to use the means provided for that purpose would render it impossible to carry on the trade with the furnace in question. The defendant was convicted, but the Court of Exchequer quashed the conviction on the ground that (assuming the furnace to be properly constructed) the words in the local Act "as far as possible" meant as far as possible consistently with carrying on the trade in which the furnace was employed.—*Cooper* v. *Woolley.*

Liability respecting Footways.—By the Ryde Improvement Act (which incorporated the Towns Improvement Act) commissioners were appointed to carry the Act into execution, and were empowered to levy rates and to apply them to specified purposes. By the Towns Improvement Act the management of streets is vested in the commissioners, who are thereby made surveyors of highways. They are by the same Act guilty of a misdemeanour for neglecting to repair any public footway within the limits of a special Act, and are liable to be indicted in the same manner as the inhabitants of a parish. In a case where a person met with an injury caused by a footway within the limits of the local Act being out of repair, the commissioners were held liable to an action, and it was decided that it was not necessary to aver in the pleadings that they had funds applicable to the care of the footway.—*Hartnall* v. *The Ryde Commissioners.*

Construction of the Words "Tenement" and "Inhabitant."—A manufacturer of edge-tools in Birmingham resided out of the town, but occasionally took his meals during the day at the factory, where his servant-man resided. He applied, under the Improvement Acts, to the town commissioners of Birmingham to remove the ashes, dust, and rubbish arising from the manufactory, but they refused to do so. It was decided by the Court of Exchequer that they were justified in so refusing, for that they were not obliged to remove ashes, &c., made from the manufactory. The manufactory was held not to be a "tenement," and the owner was held not to be an "inhabitant" within the meaning of the Improvement Acts.—*Lyndon* v. *Standridge.*

THE CABINETMAKERS OF LONDON.

SIR,—In your issue of the 26th ult. you gave a selection from the speech delivered by the Marquis of Bute before the members of the Cardiff School of Science and Art, in which he makes an indiscrimate charge of incompetency against the cabinetmakers of London. I allowed another number of your invaluable journal to appear hoping to find some one more competent than myself had replied to the charge therein made, but was disappointed: herein is my excuse for troubling you.

Now, notwithstanding the general excellence of the noble marquis's speech, I must enter my protest against the above statement. I have an intimate knowledge of the London cabinetmakers, and have had years of experience amongst them; and, instead of the above charge being correct, I can testify to numbers of them possessing practical knowledge of detail to carry out any job entrusted to them. I have often found the designs given to the workmen are not practical, and they have to be altered to the requirements of the job,—I do not mean sketches, but as working drawings. I have as workman had the honour and extreme pleasure of carrying out designs in different styles, wholly solid and others richly inlaid, principally Gothic, by Mr. Welby Pugin, Mr. Burges, and others, yet I have never had a single complaint of the jobs whilst in execution or when finished, and for years I have seen art works executed with the same result. Yet, withal, I am perfectly satisfied there is room for great improvements, to produce satisfactory results. It is necessary there should be improved relations between employer and employed—a reciprocity of feeling; but if the employer requires a foreman he advertises,—he selects one from the number of applicants. Cupidity too often prompts him to select the man possessed of effrontery, and the men feel that he is placed over them to extract all that is possible from them. He is generally ignorant of the speciality of the business. He is invested with full power, and he carries it out to the letter. I have seen the best men in a shop discharged without one moment's notice, and no reason assigned to them for the act, yet each and every one of those men mentally and morally were his superiors, and he knew it, never regard-

ing his employer's interest. By such treatment men get demoralized, which often causes them to take any advantage that arises. He not being conversant with the details of the style of work necessary to be carried out, is continually thwarting the workman in his attempts to carry out what is so necessary, and plays so important a part in good work. Now, what could be more simple than to select the best man in the shop to fill the office who understands all the requirements of the business? By so doing, there is a stimulus given to men to perfect themselves, and act as a member of the firm, in hope of promotion. Your journal has often insisted upon the necessity that all art-workmanship should bear the names of the producers; but for the full development of art-principles and art-workmanship it is necessary the workman should have a share in the profits, and feel himself a *bonâ fide* member of the firm, partaking of the honours and emoluments, or losses and disgrace, which his own actions would create or destroy. In your volume of 1865, pages 365, 386, and 514, you treat upon the relations of capital and labour, which would be to the advantage of all to study seriously. Mr. Hughes states, at page 366, "The old relations of master and men have passed away; they will never be satisfied without a share in the profits, and some voice in the internal management of the workshops. But it is to M. Leclaire that I should like attention to be drawn, page 514, wherein your readers will find how completely the interests of art are interwoven with amicable relations existing between employer and employed. WM. WARREN.

CHURCH-BUILDING NEWS.

Birmingham.—The new church of St. Gabriel, situated in Barn-street, in the parish of St. Bartholomew, has been consecrated. The cost of the edifice, including fittings and lands, has been 4,200*l.* Of that sum 3,000*l.* were contributed by the Ryland Fund, and the remainder has been defrayed by voluntary donation. The architect was Mr. J. H. Chatwin; and the builders were Messrs. Wilson & Son, of Soho, Birmingham. The whole of the gas-fittings, the church bell, and the communion-table were manufactured by Messrs. Blews & Sons, who were at the same time donors of a brass lectern, a metal reading-desk, and the chairs used in the chancel.

St. Feock (Cornwall).—The parish church of St. Feock has been consecrated. The whole fabric was put in repair more than twenty years ago. Some portion of it was then rebuilt, and the same process, as the *Cornish Telegraph* points out, might very well now be applied to the south-west angle, especially after the improvements which have just been effected in the chancel. In the spring of the year the vicar had a new reredos erected by Mr. Earp, of Lambeth; the style is Perpendicular, in accordance with that of the church. The design comprises a central ogee canopy over the holy table, flanked on each side by an arcade of sunken panels in Caen stone, separated by buttresses of two stages. The canopy is cusped and crocketed, and surmounted by a finial. The material is alabaster, the veining being sufficiently light to admit of contrast with the red Plymouth marble of the supporting columns and super-altar. Within is a panel of Salviati's mosaic, having, on a gold ground, the sacred monogram in a vesica, and passion-flowers with their tendrils and leaves on either side.

Warkworth.—The church here has been renovated by the liberality of Miss Horton, the Lady of the Manor, at whose sole expense the restoration has been effected. Mr. Franklin, of Deddington, was the builder employed in the work, under the superintendence of Mr. Charles Driver. Messrs. Heaton supplied the stained-glass window.

Bristol.—The body of Emmanuel Church was built and licensed for divine worship about two years ago; the congregation has continually increased, and so additional accommodation was rendered necessary. Funds (for want of which the designs were curtailed) being provided, the church has been so far completed as to justify its consecration, and the ceremony has now taken place. The additions, says the local *Times*, consist of a chancel and two transepts. The foundations are laid for a tower, 130 ft. high, with belfry story: a west porch and south chapel are also contemplated. Five months ago Mr. Diment, the contractor, commenced the new portion, and now it is completed. Accommodation has been provided for about 230 people more than could previously find room in the church. Of 614 sittings 100 are free and unappropriated. The fabric, which was designed by Mr. Norton, of London, now consists of a chancel, with an apse, 39 ft. by 28 ft.; two side chapels, 22 ft. by 13 ft.; transepts, 21 ft. by 14 ft.; nave, 84 ft. by 28 ft.; and north and south aisles, 63 ft. by 14 ft. each. It is constructed of local stone, with Bath stone dressings, relieved by bands of red sandstone; and the walls are strengthened with buttresses. The walls are surmounted by a parapet, with a carved cornice. Above the apse is an iron cross and finial, and on the transept gables are stone crosses. Mr. Alderman Proctor gives a tenth of the cost of the additions. The north chapel has been built mainly through the instrumentality of Mr. James Poole.

South Weald.—The parish church has been reopened for divine service. The nave, south aisle, and upper portion of the tower were taken down. The tower was originally built with Kentish rag, and has been restored with the same material, keeping the old lines and details. The body of the church consists of nave and chancel, south aisle, and lay rector's chancel. The additions to the church are the new chancel, organ-chamber, and vestry. The length of nave and chancel, 105 ft.; height to apex of roof, 40 ft.; south aisle, length, 90 ft.; height, 27 ft.; organ-chamber, 14 ft. by 8 ft; vestry, 15 ft. by 14 ft. The walls throughout are built of flint rubble, with Ancaster stone dressings. The windows are all of the same material. The roofs are of Dantzic fir, quite open. The nave and chancel roofs are of ornamental character. The south aisle roof has been so arranged as to open out the tower arch. The seats are of English oak, plain, and are all open seats. The carving of pulpit, prayer-desk, and stall ends has been executed for the contractor by Mr. Polley, of Coggeshall. Of the stone carvings, which consist of a choir of twelve angels, in white Mansfield stone, several bases and heads were executed by Mr. Earp, of Lambeth, for the contractor. Mr. Earp has also prepared a new reredos, consisting of a series of nine arches, filled in with texts of Scripture. The arches are of alabaster. A new oak porch is erected at the main entrance. The church is heated with hot water by Messrs. Goddard & Massey, of Nottingham. The bells have been re-hung on new oak frames, &c., by Messrs. Mears & Stainsbank, of Whitechapel, London, who have also supplied a new chiming apparatus, to enable one man to chime the whole of the bells. The building is of the Decorated period, and Mr. T. S. Fenton, of London, is the architect; Mr. James Brown of Braintree, the contractor; Mr. Thomas Cressy, the clerk of the works. The works have cost about 7,000*l.*, and have been defrayed by the vicar, lay-rector, &c.

ARCHITECTS' LIABILITIES.

SIR,—Will you kindly favour me with your opinion in your next issue on the following points?

Upon a church restoration there is an architect's clerk of works employed, with the usual powers as to construction of the building, quality of the materials, &c., &c. In the course of the work it is found that a beam would be placed in what the contractor's foreman considers dangerous proximity to a flue, and he called the attention of the clerk of works to it, who gives instructions for the casing of the beam to be delayed until he can see it done. He (the clerk of works) is *present* on the scaffold, when the beam was cased under his *personal supervision*, and the work is left (as is supposed) perfectly safe. In a short time after, the church is burnt down, from the defective casing of this very beam.

1. Upon whom does the responsibility rest?—the architect, the clerk of works, or the contractor?

2. If an architect, in giving a final certificate for balance of contract and extras, is or is not *bound* to give an *account* showing how the balance is made, if it should be demanded from him by the contractor? FAIRPLAY.

*** If this statement be correct, the contractor is clearly not to blame, but the clerk of the works, for whose acts, if he were appointed by the architect, the architect would probably in law be deemed responsible. This responsibility, however, is a very serious matter, and should have the consideration of architects as a body.

The reply to question No. 2 would depend on the conditions of the contract. Such an account is usually given.

THE NEW MEAT MARKET, SMITHFIELD.

How praise great Jones's work, where men
Have coolly swept away each *pen*?
But that this sarco-phagus may endure,
From the first butcher's stall I *seize a skewer*,
To tell how *Jones*, the genius, waved his wand,
While *Browne* and *Robinson* * obeyed command
Like bricks—with bricks. The butchers' palace rose
Where once unsavoury odours smote the nose;
And for a structure grand, and no Aladdin-myth,
Browne, Jones, and Robinson, usurped the *field of Smith!*

ACCIDENTS.

Fire at Messrs. Chance's Glass Works.—A fire recently broke out in the glass-works belonging to Messrs. Chance, at Spon-lane, Birmingham. Efforts were at once made to prevent the fire spreading from the box-room to the store-room, next to which is another pile of buildings, said to contain goods worth 20,000*l.* The place where the fire began was entirely gutted, and the roof of the goods warehouse completely destroyed. The damage is roughly estimated at about 3,000*l.* The works of Messrs. Chance cover about thirty acres, employ 1,700 people, use nearly 1,800 tons a week, make their own gas, have their own saw-mills, pot-rooms, and clay-mills.

Fall of a Warehouse Floor at Ipswich.—A serious accident has occurred at a new seed warehouse, at the corner of Bridge-street and St. Peter's Dock. The warehouse has not been long completed, and is used for the storage of linseed. It is three stories in height, and consists of a centre and two wings, and it was to the first floor of the centre that the accident occurred. The space below the floor is that into which wagons with loads of seed are drawn, and where they are unloaded, and the main supports to the floor were two wooden beams, each strengthened by an iron girder down its centre: the ends of these rested on four piers of brickwork, two on either side of this part of the building, and the load it was calculated that each beam would support was 200 tons. Several cargoes of seed had arrived, but the quantity placed upon the floor in question did not much exceed half the weight calculated as its full load. Without any warning the iron girders of both beams gave way, the beam furthest from the entrance-gates snapped in two, and that half of the floor with its load of seed fell in, carrying with it the upper part of the two piers, and a small portion of the brickwork of the end wall, but the seed slipping off the other portion of the floor it remained in its place. The accident is supposed to have arisen from defects in the iron girders.

Fall of Two Houses in Liverpool.—In Jamaica-street, Toxteth Park, the Corporation have in course of demolition a block of buildings the removal of which is requisite for certain improvements to be carried out. While the men were at the work of piecemeal destruction, the outer wall of one of the houses suddenly came down wholesale. The remainder of the block fell immediately afterwards, and in the general wreck one of the workmen was buried and severely bruised.

Fall of a Railway Embankment.—On the London and South-Western line, at the western end of the Exeter tunnel, several tons of earth and rock recently fell upon the up-line, which was blocked up during the night. The disaster had been expected for some days previously. Some men were then working at the Honiton tunnel, where a similar catastrophe occurred some weeks ago.

Fall of a Chimney.—On Sunday last two men, named respectively James Fields, bricklayer, and John Flynn, labourer, were killed in Glasgow, by the falling of a chimney-stalk, between 90 ft. and 100 ft. high, connected with the works of Messrs. Robert Fields & Co., Parliamentary-road. The stalk had been deemed insecure, and the men who have been killed were employed, with two others, in lightening the structure by taking 20 ft. from the top. For this purpose cross-stays were erected inside the stalk, by means of which Fields and Flynn ascended to the top, where they removed the bricks, and dropped them down the inside, whence they were removed by the other two men through an aperture which had been formed

* The builders.

of about 5 ft. high and 3 ft. wide. While they were so engaged on Sunday last the stalk suddenly gave way at the bottom.

"CHOOSING THE WEDDING-GOWN."

ART-UNION OF LONDON.

THAN this picture, by Mulready, it would be difficult to find, in the entire range of modern art, any work more pre-eminently combining skilful composition and drawing with thorough knowledge and masterly exposition of the theory of colour, whether exemplified in harmonious gradation or bold contrast. Though coloured on the warmest scale, the reds are so skilfully toned and so counterpoised by cooler tints, that the whole produces a rich mellow effect on the eye, analogous to that of a judiciously-planted flower-bed of bloom and foliage combined.

The sentiment and composition are no less excellent than the colouring. The exquisitely easy *pose* of the bride's figure, the *bonhommie* of the old mercer, and the interest with which the young parson watches his betrothed, are all admirably given. The work is full of valuable instruction, both for the draughtsman and the colourist.

When this picture was exhibited in 1846, it was felt that Mulready had given new interest to an old story. That the popularity of the subject has not waned is proved by the number of copies constantly being made of the original in the South Kensington Museum, and the crowd of visitors always attracted to it. Though the "Vicar" says he chose his wife not "for fine glossy surface," but "such qualities as would wear well," we must allow him to have been exceptionally fortunate in getting thrown into the bargain the graceful form and sweet face of the dameel before us.

This picture the Council of the Art-Union of London has had reproduced in chromolithography for the subscribers of the current year, and, looking at the extreme difficulty which necessarily attends the production by mechanical means of such a work, we must allow that great success has been achieved by Mr. Vincent Brooks and his assistants. No little artistic knowledge and able management of colour are required to produce, by printing from stone, a similar effect to that of colour laid on by the brush, and when it is known that no less than thirty-four stones have been used for as many different gradations of colour, and that every printing must coincide to a hair's-breadth with all that have preceded, the difficulty of the work can scarcely be overrated. We may certainly congratulate the members of the society on the opportunity thus afforded them of getting for the amount of the subscription so faithful a transcript of this masterpiece of England's great colourist, besides the chance of prizes.

It is announced that the impressions will be ready for the subscribers on the 1st of February.

DECORATION OF THE GREEK CHURCH IN LIVERPOOL.

AT the Liverpool Court of Passage an action has been tried, in which Lazarus Syreloff, a Greek artist, sued Mr. George M. Papayanni, of the well-known firm of Papayanni Brothers, of Liverpool, merchants and steamship owners. The declaration in the pleading alleged that the plaintiff was induced by the defendant to come to Liverpool, at great expense, upon the promise that on his arrival there he would be employed to execute paintings for the Orthodox Greek Church now in course of completion in Parliament-street, but that the defendant had refused to perform his promise. There was also a claim for work done. The defendant pleaded, amongst other things, that he had not agreed as alleged, and that the agreement was subject to a condition which had not been fulfilled by the plaintiff. The defendant is one of the committee of subscribers by whom the erection of the church is being superintended. It was thought desirable by these gentlemen to secure the services of a Greek artist for the decoration of the church, and the defendant accordingly communicated with a gentleman residing in the Levant, who recommended the engagement of the plaintiff, then living at Chios. The defendant then wrote to the plaintiff, offering him a free passage to Liverpool, and agreeing, according to the plaintiff's case, to engage him on his arrival here to paint ten large paintings and some smaller ones for the embellishment of the church, and to find him a passage home again at the conclusion of his work, which was to be accomplished by the 1st of July, 1867. The plaintiff came to Liverpool in 1866, in one of the defendant's steamers. On his arrival there he painted a picture for the approval of the defendant and the other subscribers, which the plaintiff asserted was approved by them, but the church not being ready for the reception of the pictures, the plaintiff was not employed. The defence was that Mr. Papayanni acted only as one of the committee, and not on his own responsibility. It was said that the plaintiff entirely failed to please the artistic taste of the committee. Mr. Basilio Papayanni, the defendant's brother, then offered him a free passage home, and promised to obtain subscriptions for him. He also entertained the plaintiff at his own house for six months. —The jury returned a verdict for the defendant, but expressed their opinion that Mr. Papayanni should give the plaintiff a free passage home. A passage, it was stated, would be at the plaintiff's service any time when he chose to avail himself of it.

THE CHIMES AT BOSTON.

SIR,—I am sorry to notice in your valuable periodical the publication of letters which have for their object an attempt to depreciate the carillons or chimes lately set up at Boston by Messrs. Gillett & Bland, of Croydon. Being a most disinterested party, I may perhaps be allowed to express my view of such hostile conduct.

As an amateur, I went to Boston last June purposely to see and examine these novelties. Unfortunately the work was not finished; but I saw quite enough to warrant me in saying that I fully concur with Mr. Denison in what he says as to "the magnificent machinery which has been constructed for producing the chimes—infinitely superior to everything else of the sort for promptitude, certainty, and regularity of action." Indeed, I will go further—for, though a country parson, from circumstances which I need not repeat here, I happen to know the difference between good workmanship and bad—and I question whether it is possible for any parties to turn out a more masterly production. I had no opportunity of seeing the barrels *at work*, nor of hearing the bells sounded in concert; but I examined the details of the machinery, and tested the tones of the bells individually, and they appeared to me to be of admirable quality and of very sweet tone. If, as it is stated, the big bells and the little ones do not blend together in perfect harmony, the fault may be with the founder, if he has cast the whole set from the same alloy, instead of graduating the proportions of metal according to the size. Be that as it may, and whatever may be said by any hostile critics, I have not the slightest doubt but that eventually the Boston chimes or carillons will not only be the first, but the finest in the kingdom.

It was a saying of my friend, the late Sir Mark Isambard Brunel, whose inventive powers were perhaps never surpassed—"Ah! it is very easy to invent a thing, but very difficult to make it *do;* and when you have, after much labour and anxiety, succeeded, some ill-natured, jealous person will be found eager enough in endeavouring to run it all down; but, never mind—what is good will prevail, and that's enough for me."

H. T. ELLACOMBE, M.A.

*** We have from "G. L." a reply to Mr. Walesby's note, but do not think it necessary to print it.

AIR TO HOLLOW WALLS.

SIR,—In last week's *Builder*, I observe a letter from "A. B. C." (page 25), inquiring the best mode to supply air to hollow walls. We prepare a large quantity of our Patent Damp Proof Course for this very purpose, by connecting holes on the upper side of the slab (beneath the hollow in the wall) with the longitudinal holes running throughout the entire length of slab. The vitrified course thus answers three purposes,—1. Prevents the damp rising; 2. Admits air to hollow walls; 3. Prevents dry rot in the floor timbers. CHARLES LUCENA.

SIR,—In reply to your correspondent "A. B. C.," who asks "if air bricks are necessary to the construction of hollow walls;" I beg to say they are not. A house should not only be dry, but warm in winter, and cool in summer. To insure this the internal temperature should be beyond the influence of external change. An air space hermetically sealed is an effectual non-conductor of heat or cold. The introduction of air bricks would promote circulation within the air space, and thus destroy that uniformity of temperature which is so much to be desired.

GEORGE JENNINGS.

THE FEVER HOSPITAL AT HAMPSTEAD.

SIR,—With reference to your notice, in the *Builder*, of the hospital about to be erected at Hampstead from our plans, we wish to say that the original estimate was "15,000*l*., exclusive of engines, boilers, and machinery," the cost of which, together with providing for six additional patients, for which we received the instructions of the committee, has raised the total estimated outlay to 17,970*l*., and not to 19,000*l*., as stated. Moreover, no "alterations" have been made in the plans, except those necessitated by this increase in the accommodation, and they are now before the Poor Law Board. The cost will not exceed "172*l*. per bed," but for the purpose of comparing this hospital with other projected buildings of the same class, it must be borne in mind that the "cost per bed" will always have reference to the number of patients under the same "administration," and that as the latter increase in number the cost will be in a diminishing ratio; also that four of our pavilions are "one-story buildings," which, we need scarcely remark, adds to the cost, as does the very considerable fall in the levels of the land.

PENNINGTON & BRIDGEN.

PROPOSED RESTORATION OF CHRIST CHURCH CATHEDRAL, DUBLIN.

THE Dean and Chapter, at last taking steps to put this very interesting building into a decent state, applied to Mr. G. E. Street to advise them as to what should be done, and that gentleman has accordingly made a report on the subject, and illustrated it with plan, section, and elevation of part of the north side of nave. Examining the crypt, he is led to believe that its age is uniform throughout; or, at any rate, there is very little difference. The pointed arch occurs in its construction throughout; and the square piers which support the vaults are almost all chamfered, and the chamfers have an ornamental stopping which is certainly not earlier than the end of the twelfth century.

It follows from this, in Mr. Street's opinion, that no part of the old Irish Cathedral built by Bishop Donat, now remains; and that the Church which we have contains nothing earlier than the work of the English artists who followed the invasion of Strongbow, and who left so many marks of their presence in the beautiful works which they erected throughout the Pale.

"At first sight the planning of this crypt looks so much more like that of a Norman work than of a Pointed building, that it is important to insist upon the fact that, in point of date there is very little difference between the completion of the crypt and the erection of the Church above, and that whatever Church existed on the site before the time of the English Invasion, was entirely removed in order to provide the necessary foundations for one on a large scale. I see no reason whatever to doubt that the whole of the Choir was erected on the same plan as the Crypt, and that from the beginning of the thirteenth century to the middle of the fourteenth it stood unaltered."

The unsatisfactory choir being sound, he proposes to confine the new works to the nave, which is very bad; to build up large buttresses opposite each of the principal columns of the nave to support the clearstory; and to rebuild the south aisle. The estimate of these and other works necessary stands thus:—

"1. I estimate the cost of the south aisle and south arcade and clearstory complete, as shown in my plans, at a sum of	£7,000	0	0
2. The cost of the alterations in the west end, the new door, window, coping to gable, buttress, &c., I estimate at	1,265	0	0
3. The whole of the works in the north aisle and north side of nave	5,000	0	0
4. The] groining, &c., of nave (in wood)	1,320	0	0
5. The cleaning and repairing interior of transepts	500	0	0
6. The paving of nave and aisles	485	0	0
7. The paving of transepts	265	0	0
Total cost ...	£15,835	0	0"

Mr. Street's proposition to finish the walls of both aisles and clearstory "with the characteristic Irish battlements" seems to us worth reconsideration: this rude sort of finish scarcely agrees with the fine thirteenth-century work of the fabric.

COMPETITIONS.

Eaton Suburban Church, Norwich.—In reply to invitation seventeen sets of drawings from architects residing in various parts of the kingdom, were received. From this number the committee selected four sets,—two from London, one from Edinburgh, and one from Norwich; and at a meeting of the committee, held on the 7th inst., it was determined to adopt the design of Messrs. Browne & Pearce, of Norwich.

Lincoln County Prison.—The magistrates received twenty designs in reply to their advertisement, and after several meetings reduced that number to three, and then referred the selected plans to Mr. Barnard Hartley, the county surveyor of the West Riding of Yorkshire. Ultimately the design of Mr. Frederick Peck, architect, London, was selected. The committee recommended that a grant of 100*l*. be made to Messrs. Jones & Lee, architects, London, whose plan appeared second in merit, and 50*l*. to Mr. Moffatt, architect, Edinburgh. The prison is to be built at Lincoln, and will be commenced as early as possible.

Wesleyan Chapel and Schools, Pill, near Bristol. In a limited competition for this work, the designs by Mr. E. A. Lansdowne, architect, were chosen.

DIAPER BRICKWORK.

WE have inspected with great pleasure a number of bricks with diapered surfaces, also string courses, and columns, produced under Pether's Patent. Ancient examples of diaper work in brick are well known, but hitherto the few attempts to approach the object have failed, from the great expense of ordinary moulding, and the very prohibitory excise duty formerly imposed on such work. By machinery patented by Mr. H. Pether, bricks with elaborate designs, either in delicate or bold relief, can be produced at a moderate cost (6*l*. a thousand), either from patterns now prepared by him or from designs furnished by architects. Many of these will admit of the introduction of ceramic colour, or the insertion of gilt or other glass. Mr. Pether obtains a small joint, by the contrivance of a recess or kick on all other sides of the brick to receive the bulk of the cement, thus forming a strong union and key. The Burham material is particularly sound, and most of the designs already prepared are very artistic. We are disposed to think good use may be made of this invention.

RAILWAY INTELLIGENCE.

Progress of the Railway in the Thames Embankment.—At the meeting of the Metropolitan Board of Works last week, in answer to a complaint by Mr. Shaw, the engineer stated that he had no hesitation in saying that the works of the railway company on the Thames Embankment, if carried on at the present rate, would not be completed in six years. The works in the new street from Blackfriars to Cannon-street had not even been commenced. The interest on the money due had not been paid. Mr. Newton said it was quite time pressure was put on the railway officials to force them to carry on their works. The subject was referred to the works committee for report.

A Dangerous Railway Platform. — At the Secondaries' Court, before Mr. Secondary Potter and a special jury, the case of Walker *v.* The Great Eastern Railway Company has been heard. This was an action in the Common Pleas to recover compensation for personal injuries at the Lea Bridge Railway Station, through, as alleged, a "rotten platform." The damages were laid at 2,000*l.* The plea was withdrawn and judgment suffered by default. Plaintiff was walking along the platform from a train when he fell into a hole in the platform. He was much hurt, and had since been, and still was, unable to work. The jury assessed the damages at 250*l.*

PROGRESS IN BELFAST, IRELAND.

ACCORDING to a report made to the Town Council at their last meeting, it appears that since the Belfast and County Antrim Borough Act was put in force the 1st July, 1866, there had been 302 private streets formed and completed—sewered and paved—under the Borough Surveyor's superintendence. Since 1861, when the last census was taken, 10,078 houses had been erected, and of these 1,602 had been built during the year which had just expired. The valuation of property had increased in the borough. In 1861, the valuation of the borough was 278,807*l.*, while at the end of the year which has just closed it was 417,329*l.*, showing an increase during the last seven years of 138,522*l.* The surveyor had been able to accomplish a great many improvements in the other streets of the town. During the year 1,467 new houses had been erected on the County Antrim side, and 135 on the County Down side, making a total of 1,602*l.*

PROVINCIAL NEWS.

Bristol.—The new White Lion Hotel, in Broad-street, has been opened for business. The building has been erected from designs by Messrs. Foster & Wood, of Bristol, architects; and the structure above the principal floor occupies three sides of a square, so that the rooms enjoy as much natural light as possible, Christ Church, at the top of the street, forming the fourth side. The principal entrance is in Broad-street, where a flight of steps leads to a vestibule and hall, 70 ft. by 20 ft., covered by a glazed roof supported on bays of arches, with pillars and carved capitals. The panels below the roof have been decorated by Mr. Lang, of London, with designs representing the seasons. On the right of the entrance are the coffee-room, 42 ft. by 28 ft.; club-room, 37 ft. by 21 ft.; bar, still-room, offices for the manager, &c. On the left is provided a capital commercial-room, 50 ft. by 28 ft., with writing-room and lavatory attached; a restaurant, 48 ft. by 26 ft., approached from a side entrance, with bar and service-room adjoining, fitted up by Messrs. Llewellin & James. The coffee and commercial rooms abut on the terraces in front of the hotel. Behind the hall, and separated from it by a secondary entrance and passage, is the billiard-room, which can also be reached from Wine-street; the apartment measures 42 ft. by 24 ft., and is fitted up with two of Thurston's best club tables; the scoring apparatus is of the most perfect kind. Adjoining the billiard-room are a smoking-room, lavatory, &c. All the chief rooms on this floor are 16 ft. high. The principal staircase, which is of stone throughout, commences behind the commercial-room. On the first floor are a ladies' coffee-room, 25 ft. by 20 ft., numerous suites of sitting-rooms, and some few bedrooms. The second floor, and also the third, are devoted to bedrooms. The floors are all fireproofed by Dennett's patent construction. At the top of the building, on the lower corner, is an immense tank, filled with water, which will be available in case of emergency. There is a luggage lift from the bottom to the top of the house, and another for the conveyance of provisions from the kitchen to the bar. An apparatus for supplying hot water all over the house is provided. There are over 200 rooms and about 560 windows in the hotel. The contractors were Messrs. Warburton, of Manchester; Mr. Boulton has done the carving.

Cannock.—The covered market, which has been erected by a joint-stock company, and has been built, at a cost of about 1,300*l.*, by Mr. M. B. Anderson, of Cannock, from designs by Mr. T. Lloyd, of Wolverhampton, has been thrown open to the inspection of the public.

DISSENTING CHURCH-BUILDING NEWS.

Dovenby.—A new Congregational chapel, which has been erected at Dovenby, near Cockermouth, has been opened for divine service. The chapel has been built from the design of Mr. T. L. Banks, of Cockermouth, architect, and is in the Gothic style of architecture, with a high-pitched roof and a semi-octagonal ceiling. The building of the edifice was commenced in the course of last summer, the masonry being let to Mr. Henry Grave, of Aspatria, and the joiner's work to Mr. P. Robinson, of Cockermouth. The chapel has cost about 200*l.*, and is capable of accommodating between eighty and ninety persons.

STAINED GLASS.

Holy Trinity Church, Worcester.—The centre window of the five in the apse of this church has just been filled with a design in stained glass by one who, having had a legacy left him as one of the executors to a gentleman lately deceased, has devoted it to this purpose. The window is by Mr. Wailes, of Newcastle. It is in the Decorated style, and includes three principal lights, each between 9 ft. and 10 ft. high, and stone tracery under the arch. The entire window has been filled with stained glass, the subject being that of the Ascension of our Lord. The figure of the Saviour occupies the upper portion of the central compartment; in those on each side are represented choirs of jubilant angels; while the eleven Apostles and the holy women are variously grouped below. Each light is terminated by a canopy, worked with foliage upon a ruby background. The tracery under the arch is filled with a running wreath of foliage glass in various tints, upon background of ruby and purple.

Miscellanea.

Proposed Margate Pier and Harbour Company.—A Bill for the incorporation of the Margate Pier and Tramway Company has been published. The proposed capital is 12,000*l.* in 12,000 shares, of 10*l.* each. The Bill applies for the carrying out of many improvements and the use of certain new powers of various kinds, including power to make specific charges for persons and goods passing along the pier. The corporation are neutral in the matter. The Commercial Union have resolved that a requisition be sent to the mayor, signed by the burgesses, asking him to convene a public meeting for the consideration of the project.

Lead-poisoning on the Tyne.—The *Lancet* says,—"A valued correspondent reminds us of a fact of which we were not altogether ignorant—that there is a great amount of lead-poisoning involved in the various works on the Tyne. He says 'it is pitiful to see the number of young girls suffering from lead.' It is not improbable that this subject of lead-poisoning will be brought before Parliament. It is of sufficient importance to be a matter of inquiry, whether we consider the suffering involved in lead-poisoning, or the frequently early disablement of the sufferer in various ways."

Gas.—The Staines Gas Company have declared a dividend of 7½ per cent., free of income-tax, for the past year. They are extending their works.——The Bewdley gas consumers complain both of the price and the quantity of their gas, or its quality. The price is 6s. 8d., and they have nothing for that but darkness made visible. This they cannot understand considering the position of Bewdley with reference to coal.

The Liverpool Free Public Libraries Report.—This document has been issued in a printed form. It states that there is nothing of special interest to report during the year just expired. The Institution has pursued its career of usefulness, increasing as its treasures increase, and is at present in a thorough condition of efficiency. The Committee regret they cannot report much further progress towards the erection of the permanent Gallery of Art. The Council have sanctioned the outlay of 10,000*l.*, provided the interest and redemption fund can be met out of the penny rate levied under the special act. During the past year the average number of books issued from and returned to the Reference Library has been 1,982 per day, the yearly circulation numbering 565,344 volumes, against 573,774 during the previous year. During the year, 1,973 volumes of books have been added to the Library, viz., 1,686 by purchase, 119 from the Commissioners of Patents, and 68 volumes by donation. From the Lending Libraries, 423,547 volumes have been lent. The total number of volumes in these libraries is 39,035. The circulation has been equivalent to lending each volume ten times in the year; and each reader has had 50 volumes, or nearly one a week. The works of music issued, viz., Operas, Oratorios, Masses, &c., number 3,492 volumes. As regards the Museum, compared with the average of five years, the total number of visitors in 1867-8 is very nearly 10,000 in excess, as shown by the following figures:—Total number of visitors in 1867-8, 463,851; average of the five years preceding 1867-8, 453,914; excess in 1867-8, 9,937.

Manchester Academy of Fine Arts.—The ninth annual general meeting of the members, associates, and students of this Academy has been held in the council-room of the Royal Manchester Institution; the president, Mr. W. K. Keeling, presiding. There was a numerous attendance. The hon. secretary (Mr. Selim Rothwell) read the annual report. The council remarked that they had again the satisfaction of stating an increased success, and a considerable addition of associates and students during the past year. There were twenty-eight members, eight associates, and ten students. The report having been adopted, the president and secretary were again re-elected; Mr. Crozier as treasurer, and Mr. Hadfield literary secretary.

The Law Courts and Thames Embankment.—Mr. Tite, M.P., at the Metropolitan Board of Works, has given the following notice of motion:—

"Whereas it appears by certain public documents emanating from the Commissioners for building the New Courts of Justice that the actual cost of the site purchased in the Strand will amount to 785,000*l.*, and that the additional land now proposed to be purchased, according to Mr. Pownall's estimate, is 668,000*l.*, so that the total cost of the ground will be 1,453,000*l.*, and the expenditure on land and buildings together, as appears from the same document, will be 3¼ millions, of which 1,395,150*l.* are proposed to be advanced by Government at 4 per cent., on the security of a redeemable annuity; and whereas the Equity, Common Law, and other Courts could easily be accommodated on the site already purchased by the Commissioners, that the Probate Court, Master's and Registrar's offices could be placed on the site afforded by the Thames Embankment, with such supplementary acquisitions as the nature of the proposed building may require, by which means a considerable reduction would be effected in the cost of the land to be taken, and a position would be obtained superior to any in regard to free circulation of air, unimpeded light, and in the facility of access by road, river, or rail,—that it be referred to the Works Committee to consider the extent required for the suggested buildings, the area at present at the Board's disposal, and what additional property would require to be taken adequately to provide for the several offices enumerated; and that the committee be authorized to confer with her Majesty's Government as to their willingness to negotiate for the acquisition of such a site for the purposes above indicated."

Abbey-mills Pumping Station.—The Metropolitan Board of Works has appointed Mr. Usher, who has been engaged in superintending, under the direction of the engineer and assistant engineer, the erection of the machinery, to the office of superintendent of the station, at a salary of 250*l.* per annum, with house-rent, coals, and gas, and he is to remain on the premises. The Board also determined that the staff at the station and weekly wages to be paid to each shall be as follows:—Four engineers, 36s.; two firemen, 24s.; two coal trimmers, 21s.; four cleaners, 21s.; two oilers (youths), 15s.; two flushers, 24s.; one smith, 36s.; one hammerman, 24s.; one clerk, 30s.; one lodge-keeper, gardener, and messenger, 24s.; one night watchman, 21s.

Destruction of the Prince of Wales Theatre, Glasgow.—This theatre died the natural death of theatres on Wednesday night last.

Masons Insisting on the Help of Stone-dressing Machinery.—About two months ago a strike was the result of Messrs. Beauland, of Bradford, attempting to use stone steps dressed by machinery at the Idle quarries, near Bradford, and the men returned to work on their employers allowing the men to re-dress, by hand, work already dressed at the quarry by machinery. Messrs. Beauland ultimately insisted on their men dressing the stone for the steps entirely by hand; but his men now insisted that the stones should be partially prepared by machinery at the quarries, and finished by hand-labour at the new buildings. The stone from Idle had, in fact, been found too hard for the labour, in dressing by hand, to be remunerative. The result is a strike on the part of the masons against the use of stone wholly undressed from the quarry.

Presentation of Bells to St. Julian's, Shrewsbury.—Mr. J. J. Peele, town clerk of Shrewsbury and a churchwarden of St. Julian's, has just presented a peal of six fine bells to the parish. The bells were cast by Messrs. Mears & Stainback, and have been hung in the tower of the church, in lieu of a like number of bells anciently placed there and requiring renewal. The mottoes inscribed on the several bells are,—

No. 1.
"Peace on earth," &c.—Luke, chap. ii.
"My gentle note shall lead the cheerful sound;
Peace to this parish, may goodwill abound!"

No. 2.
"Our voices tell when joy and grief betide;
Mourn with the mourner, welcome home the bride."

No. 3.
"May all in truth and harmony rejoice!
To honour Church and Queen with heart and voice."

No. 4.
"*Prosperity* attend old England's shore;
Let Shrewsbury flourish, now and evermore."

No. 5.
"For mercies undeserved this *peal* is raised;
So may Thy name, O God, through Christ be praised."
J. J. P.

No. 6.
"With deepest tone I call to church and prayer;
And bid the living for the grave prepare."

The New Magdalen Hospital at Streatham.—The extensive range of buildings for the new Magdalen Asylum recently erected at the rear of the railway asylum at Streatham is now nearly completed, and the inmates at present located in the old hospital in the Blackfriars-road will be forthwith removed to the new institution. The new hospital extends over eight acres of land. A church has been built within the grounds, for the public in common with the inmates.

"The Architecturesque."—At the next meeting of the Institute of Architects on Monday evening, the 18th inst., Professor Kerr is to treat the subject of "The Architecturesque;" in continuation, we are reminded, of a preliminary lecture to the Architectural Association fully reported in the *Builder* of March 7th and 14th last.

Schools for St. Luke's District, Gloucester. It is proposed to erect these schools in, and facing, the Stroud-road. The buildings will consist, on the ground-floor, of boys' schoolroom (70 ft. by 20 ft.); girls' schoolroom (60 ft. by 20 ft.); and infants' schoolroom (65 ft. by 20 ft.); with class-rooms attached to each, and with separate entrances: accommodation is afforded for over 450 children. A house for the master is attached to the schools, with offices and yard. The house will contain parlour and kitchen on the ground-floor, and three bedrooms on the first-floor. This portion of the buildings (though entirely separate from the schools as far as communication is concerned) has been made to form a feature in the group. Open and spacious playgrounds are provided. The schools and class-rooms will be 12 ft. high to the wall-plate from the floor, and the timbers of the roof, which are to be exposed to view, will be stained and varnished. The building is intended to be of red brick, with bands of ornamental coloured bricks. The design was prepared by Mr. Alfred William Maberly, architect, Gloucester, under whose superintendence the works are to be carried out; and the estimated cost is 2,000*l.*

The Slade Bequest to University College A meeting of the Graphic Society was held at University College, on the 11th inst., the president, Mr. Foley, R.A., in the chair, when several resolutions were passed acknowledging the value of the Slade bequest, and the meeting adjourned with a view to further action. We had intended to refer to the subject of this bequest at greater length, but are forced by press of matter to defer doing so.

The late Dr. Robert Hooke.—We are told that the vicar and some influential inhabitants of St. Helen's, Bishopsgate, have formed a committee for the purpose of obtaining subscriptions for the erection of a stained-glass window in their church, as a memorial of Dr. Robert Hooke, a brief account of whose inventions and discoveries appeared in our columns a few weeks ago.

Viaduct across the Solway.—The Solway Junction Railway is now near completion. The permanent rails between Kirtlebridge and the Solway viaduct are laid, and the station-houses are being erected. The viaduct, which is a fine specimen of engineering, is now finished. The river Wampool is crossed on a viaduct of seven bays. The viaduct is similar to the one over the Solway.

The Institution of Civil Engineers.—At the meeting of this Society on Tuesday evening, the 12th instant, fourteen candidates were elected, including two members, and twelve associates.

Rotherhithe Drainage Contract.—At last week's meeting of the Metropolitan Board of Works, tenders were received for the construction of new sewers in Plough-road, Swing Bridge-road, and Trinity-street, Rotherhithe, and the diversion from the river of the sewage from the Durand's wharf outlets, which varied from 25,450*l.* to 14,750*l.*, and the lowest, that of Mr. Nicholson, was accepted.

The Builders' Benevolent Institution.—The annual ball for this excellent charity will be held at Willis's Rooms, St. James's, on Tuesday, the 26th of January, under the immediate patronage of the Lord Mayor and the Lady Mayoress. Mr. G. F. Trollope is the President, and Mr. G. Plucknett the Treasurer. Mr. Joseph Bird takes the ball, as usual, under his special care, and will receive applications for tickets up to the 22nd. Such of our readers as like an evening of the sort promised will enjoy it the more, knowing that the profits of the entertainment will go towards rendering easy the last days of distressed age.

Science Classes.—On Friday, the 8th inst., a public lecture was given at the South-west London Science School, Arthur-street, Chelsea, on the "Physical and Chemical Properties of Water," by Mr. Bickerton, head master of the science classes held there; Mr. H. J. Coles in the chair. The lecture (admission to which was 1d. to non-members) was given as the preliminary lesson for the present year to the chemistry class, the object being to show the interesting nature of scientific study and the pleasure and advantages to be derived from it.

A Covering for Staircases.—The wear of staircases is often a serious matter. Whether of wood or stone, with much usage, they soon go. M. Cazeau says he has found a durable covering in thin plates of aluminium bronze. It is for the column of the Place Vendôme that M. Cazeau proposes his covering. He says the experiment has been made in a factory, where plates of common bronze on the stairs ¼ in. thick were worn out in six weeks, while plates of aluminium bronze ⅛ in. thick remain just the same as when new, after 11 months of service. Aluminium bronze, it would seem, is not too expensive if it will bear this amount of usage. It is merely copper, with from 8 to 10 per cent. of aluminium.

TENDERS.

For pulling down and rebuilding house, for Mr. J. S. Gower, City Horse and Carriage Repository, Barbican. Mr. R. Walker, architect. Quantities by Mr. W. E. Stoner:—

Lark	£1,765	0	0
Brass	1,615	0	0
Henshaw	1,559	0	0
Sewell & Son	1,556	0	0
Prince	1,479	0	0
Kilby	1,358	0	0
Turner & Sons	1,339	0	0

For house, at Upper Norwood, for the Rev. E. Birch. Mr. Sextus Dyball, architect:—

Perry (accepted)	£2,900	0	0

Accepted for four houses, offices, &c., at Bulrush Mills, Batley, for Messrs. Talbot, Senior, & Talbot. Messrs. Sheard & Hanstock, architects:—

Mason's Work.

Farrar	£613	14	0

Joiner's Work.

Ibbersen	226	12	0

Plumber's, &c., Work.

Senior	18	0	0

Plasterer's Work.

Hey	31	0	0

For a cottage, for Mr. Thomas Brown. Mr. John Usher, architect. No quantities:—

Dickens	£270	0	0
Lawson	230	16	6
Richards	208	18	6

For new infirmary, &c., Stratford-upon-Avon Union Workhouse, for the Board of Guardians. Mr. Thos. T. Allen, architect:—

Bennett	£2,379	0	0
Dixon	2,195	0	0
Naden & Sons	2,189	0	0
Espley	2,098	16	0
Hilton	2,055	0	0
Clark & Smallwood	2,000	0	0
Green	1,983	0	0
J. & G. Callaway	1,908	17	9
Holtom & Price (accepted)	1,805	11	6

For new watercloscts, lavatories, drainage, &c., Stratford-upon-Avon Union Workhouse, for the Board of Guardians. Mr. Thos. T. Allen, architect:—

Denner	£435	10	0
J. & G. Callaway	340	0	0
Hiam, Martin, & Edwards	335	0	0
Holtom & Price	330	0	0
Horseman & Martin	311	0	0
White (accepted)	286	0	0

For the Acton Main Drainage, Contract No. 6. Mr. E. Monson, C.E., Surveyor to the Acton Local Board. Quantities supplied by Mr. Young:—

Rowles	£1,020	0	0
Smith	779	0	0
Brunsden	755	0	0
Williams	750	0	0
Haynes	735	0	0
Bloomfield	729	0	0
Robinson	695	0	0
Pizzey	670	0	0
Crockett	650	0	0
Young	613	0	0
Parker (accepted)	601	0	0
Reed (too late)	573	0	0

For proposed villa residence, for Mr. Wm. H. Withall, in the Portinscale-road, Wandsworth. Messrs. Lee, Brothers, & Pain, architects. Quantities supplied:—

Patrick & Son	£4,048	0	0
Nicholson	4,025	0	0
Van Vliet	3,869	0	0
Ebbs & Sons	3,777	0	0
Adamson & Sons	3,598	0	0
Aviss	3,500	0	0
Thompson	3,260	0	0

For villa residence, at Calne, Wiltshire, for Mr. G. Harris. Mr. John Watson, architect:—

Bladwell	£9,128	0	0
Pinnegar	8,286	0	0
Call & Pethick	6,518	0	0
Light & Smith	6,494	0	0

Tenders for Bridge at Moerdyk.—According to the *Bullionist*, the lowest tender sent in for the construction and erection of the metallic part of a great bridge over the Hollandsche Diep, at Moerdyk, on the Dutch State lines, was that of Messrs. Vlemingen & Van Heel, of Amsterdam, 146,674*l.* Among the English tenders sent in for this work may be mentioned the Newcastle-on-Tyne Iron and Coal Company, 240,000*l.*; the Butterley Company, 204,000*l.*; Messrs. T. Brassey & Co., Birkenhead, 198,532*l.*; Messrs. Vignoles, of London, 168,750*l.*, &c.

Radnorshire Gaols.—Messrs. B & A. Hamer, builders, Kington, obtained the contract for enlarging and altering the Radnorshire county gaols at Presteign, for 1,886*l.*

Springfield Park Estate.—Mr. James Bloomfield says his tender for pipe sewers was 349*l.*, not 249*l.*, as printed. The frightful discrepancy in the tenders for this work (see p. 36, *ante*) calls for some explanation. The highest was 992*l.*, the lowest 200*l.*!

TO CORRESPONDENTS.

Decay of Stone (next week).—R. F. D. C. (next week).—G. W. R. (next week).—Inquirer (next week).—Pro (next week).—J. N. (next week).—H. W. B. (next week).—R. G. S. (next week).—F. G. (the Society for Improving the Dwellings of the Poor, at Exeter Hall).—A Subscriber (the practice varies. Inquire of the surveyor of pavements in the district where it is required to introduce lights).—Langham (should consult a surveyor on the spot).—Anti-Sham (the process has been described in our pages on several occasions).—T. W.—C. W. L.—W. B.—J. W. P.—Capt. P.—S. & H.—J. W. F.—B. & J.—T. H. K.—J. W.—W. T. H—G. L.—J. B.—E. M.—Rev. G. S.—W. J. L.—F. P.—C. L.—W. W.—T. T. A.—R.—E. W. B.—T. K.—Dr. P.—E. A. L.—Rev. H. P.—W. I.—R. K.—F. R. C.—J. G. F.—J. G.—Mr. B.—A. M.—A. S. A.—W. F. P.—J. P.—J. J. M.—Q.—W.—J. W.—T. J. H.—H. T. E.—T. S. W.—C. B.—C. H.—G. B. W.—A. L.—St. J. B.—G. H. D.—H. J. C.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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